

حمل الآن

مجاناً وحصرياً

المراجعة رقم (1)

اختبار شهر مارس



Important questions on unit one



First Multiple choice questions

- 1 If $3a = 5b$ What is the value of : $\frac{3a}{b}$?
(a) 3 (b) 5 (c) $\frac{3}{5}$ (d) $\frac{5}{8}$
-
- 2 If $x, 3, y, 4$ are proportional quantities, what is the value of $\frac{x}{y}$?
(a) $\frac{3}{4}$ (b) $\frac{4}{3}$ (c) $\frac{3}{7}$ (d) $\frac{4}{7}$
-
- 3 If 2, 6, $x + 15$ in proportion, what is the value of x ?
(a) 1 (b) 2 (c) 3 (d) 4
-
- 4 If $a, 2, 4, b$ in a continued proportion, what is the value of $a + b$?
(a) 2 (b) 4 (c) 6 (d) 9
-
- 5 What number, if added to each of the numbers 1, 3, 6 becomes in a continued proportion ?
(a) 1 (b) 2 (c) 3 (d) 4
-
- 6 If 3, $x, 12$ are three proportional quantities. What is the value of x ?
(a) 15 (b) -6 (c) 6 (d) ± 6
-
- 7 If $\frac{x}{4} = \frac{y}{12}$ what is the value of $\frac{x}{y}$?
(a) $\frac{3}{1}$ (b) $\frac{1}{3}$ (c) $\frac{2}{12}$ (d) $\frac{12}{3}$
-
- 8 If $\frac{a}{b} = \frac{3}{4}$ what is the value of $\frac{3b}{4a}$?
(a) $\frac{9}{16}$ (b) $\frac{16}{9}$ (c) 1 (d) $\frac{9}{8}$
-
- 9 What is the third proportional number of the numbers : 3, 4, 8
(a) $\frac{8}{12}$ (b) $\frac{32}{3}$ (c) $\frac{12}{8}$ (d) 6
-
- 10 If $3x - 2y = 0$ What is the value of $\frac{x}{y}$?
(a) $-\frac{2}{3}$ (b) $\frac{3}{5}$ (c) $\frac{3}{2}$ (d) $\frac{2}{3}$

11 If $\frac{a}{2} = \frac{b}{5}$, what is the value of $\frac{a-b}{a+b}$?

(a) $\frac{7}{3}$

(b) $\frac{3}{7}$

(c) $-\frac{3}{7}$

(d) $-\frac{7}{3}$

12 If $\frac{a}{4} = \frac{b}{7}$ what is the value of $\frac{2a-b}{b-a}$?

(a) $\frac{1}{3}$

(b) $\frac{8}{3}$

(c) $\frac{15}{7}$

(d) $\frac{15}{8}$

13 If $\frac{a}{2} = \frac{b}{5} = \frac{2a+b}{k}$ what is the value of k ?

(a) 3

(b) 4

(c) 7

(d) 9

14 If $\frac{a}{b} = \frac{4}{3}$, what is the value of $3a - 4b + 5$?

(a) 0

(b) 6

(c) 5

(d) -1

15 If $a, 3, 4, b$ are proportional numbers, what is the value of $\frac{ab}{6}$?

(a) 3

(b) 2

(c) 25

(d) 10

16 Which of the following numbers is proportional?

(a) 4, 6, 12

(b) 2, 6, 9

(c) 3, 6, 12

(d) 4, 12, 24

17 If a is the first proportional of the two numbers 4, 8 what is the value of a ?

(a) 16

(b) 6

(c) 3

(d) 2

18 What is the third proportional to the two quantities $x, 2x^3$?

(a) $4x^5$

(b) $2x^4$

(c) $2x^3$

(d) x^2

19 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 9$, what is the value of $\frac{a+b+c}{b+c+d}$?

(a) 3

(b) 9

(c) 1

(d) 10

20 If $\frac{a}{2} = \frac{b}{3} = \frac{c}{5} = \frac{2a+b-3c}{-2k}$ what is the value of k ?

(a) 2

(b) 4

(c) 8

(d) 16

Second Essay questions

1 If $\frac{x-2y}{x+3y} = \frac{3}{5}$, find the value of $x:y$

2 If $\frac{x}{y} = \frac{2}{3}$, find the value of: $\frac{3x+2y}{6y-x}$

3 If $\frac{4}{x} = \frac{7}{y}$, find the value of : $\frac{7x+2y}{4y}$

4 If a, b, c, d are proportional quantities, prove that : $\frac{a+2c}{b+2d} = \frac{c-a}{d-b}$

5 If a, b, c, d in a continued proportion, prove that : $\frac{a}{b+d} = \frac{c^3}{c^2d+d^3}$

6 Find the number that if added to each of the numbers 3, 5, 8, 12 become proportional.

7 If $\frac{a}{b-a} = \frac{c}{d-c}$, prove that : a, b, c, d are proportional quantities.

8 If $\frac{x}{4} = \frac{y}{5} = \frac{z}{3}$, prove that : $\frac{x-y+z}{x+y-z} = \frac{1}{3}$

9 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, prove that : $\sqrt{x^2+y^2} = 2x+y-z$

10 If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a-2b+5c}{3x}$, find : the value of x

11 Find the number that if added to the ratio 5 : 11 becomes 4 : 7

12 Find the positive number that if its square is added to the ratio 7 : 11 becomes 4 : 5

13 If $x, y, 12$ are proportional, $y-x=3$, find each of : x, y

14 If the numbers : 4, $a, b, 32$ in a continued proportion, find the value of : a, b

15 If b is a mean proportional between a, c , prove that : $\frac{a^2+b^2}{b^2+c^2} = \frac{a}{c}$

16 If $\frac{a}{2x-y} = \frac{b}{2y-x}$, then prove that : $\frac{2a+b}{x} = \frac{a+2b}{y}$

17 If $\frac{x+y}{7} = \frac{y+z}{5} = \frac{z+x}{8}$, then prove that : $\frac{x+y+z}{x-z} = 5$

18 If $\frac{x}{2a+b} = \frac{y}{2b-c} = \frac{z}{2c-a}$, then prove that : $\frac{2x+y}{4a+4b-c} = \frac{2x+2y+z}{3a+6b}$

19 If a, b, c are positive quantities such that $a : b : c = 3 : 4 : 5$ and $a^2 + b^2 + c^2 = 450$

- Find the value of : $a - b + c$

20 If a, b, c, d are in continued proportion, prove that : $\frac{a^3+b^3+c^3}{b^3+c^3+d^3} = \frac{a}{d}$

Important questions on unit two



First Multiple choice questions

1 If $(125, \sqrt[3]{y}) = (x^3, 4)$ What is the value of $x + y$?

- (a) 15 (b) 21 (c) 7 (d) 10

2 If $(3b, 2) = (2a, b)$ What is the value of $\frac{a}{b}$?

- (a) $\frac{3}{2}$ (b) $\frac{2}{3}$ (c) $\frac{1}{2}$ (d) 2

3 If $X = \{3\}$, then $X^2 = \dots\dots\dots$

- (a) 9 (b) $(3, 3)$ (c) $\{9\}$ (d) $\{(3, 3)\}$

4 If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $x - y = \dots\dots\dots$

- (a) 1 (b) -1 (c) ± 1 (d) 0

5 If $(3, 7) \in \{(3, x), (3, 8), (3, 6)\}$ What is the value of x ?

- (a) 8 (b) 7 (c) 6 (d) 3

6 If $Y = \{3, 4\}$, $X = \{1, 2\}$, then $(3, 4) \in \dots\dots\dots$

- (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

7 If $X \times Y = \{(2, 3)\}$, then $X^2 = \dots\dots\dots$

- (a) $\{(4, 9)\}$ (b) $\{(4, 3)\}$ (c) $\{(2, 2)\}$ (d) $\{(2, 9)\}$

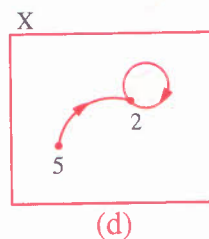
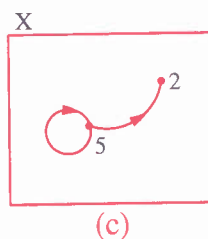
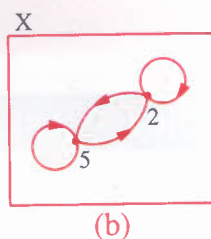
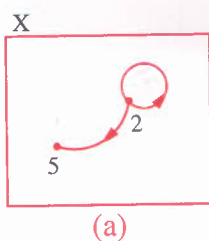
8 If $n(X) = n(X \times Y)$, then $n(Y) = \dots\dots\dots$

- (a) 1 (b) 2 (c) 3 (d) 4

9 If $n(X \times Y) = 6$, $n(X) = 2$ what is the value of $n(Y^2)$?

- (a) 4 (b) 9 (c) 16 (d) 12

- 10 If $X = \{2, 5\}$, then which of the following arrow diagrams does express a function of the set X ?



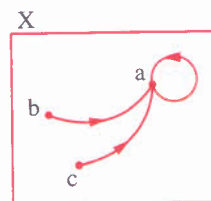
- 11 The opposite figure represents a function on X , its range =

(a) $\{a\}$

(b) $\{a, b, c\}$

(c) $\{a, b\}$

(d) $\{b, c\}$



- 12 If $R = \{(4, 3), (1, 3), (2, 5)\}$, then R represents a function whose range =

(a) $\{2, 1, 4\}$

(b) $\{5, 3, 2, 1, 4\}$

(c) $\{5, 3\}$

(d) $\mathbb{N}$

- 13 If $X = \{1, 3, 5\}$ and $f: X \rightarrow \mathbb{R}$ Where $f(X) = 2X + 1$, then the set of images of the domain elements using the function f is

(a) $\{3, 5, 11\}$

(b) $\{3, 7, 9\}$

(c) $\{1, 3, 11\}$

(d) $\{3, 11, 7\}$

- 14 If $f(X) = 1$, then $f(1) + f(2) =$

(a) 1

(b) 2

(c) 3

(d) 4

- 15 If $f(X) = 5$ what is the value of the expression: $\frac{f(5) + f(-5)}{f(2) + f(-2)}$?

(a) 1

(b) 5

(c) 10

(d) undefined.

- 16 If $f(2X) = 4$ what is the value of $f(-X)$?

(a) -2

(b) -4

(c) 4

(d) 2

- 17 If $f(X) = 2$ what is the value of: $\frac{f(4)}{f(0)}$?

(a) 4

(b) 1

(c) 2

(d) undefined.

18 If $f(x) = (1 - x)^2$, then $f(-1) = \dots\dots\dots$

- (a) 0 (b) -4 (c) 4 (d) 2
-

19 If the line representing the function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 3x - a$ passes through the origin, what is the value of a ?

- (a) -3 (b) 0 (c) 2 (d) 3
-

20 The function f where $f(x) = 3x$ is represented graphically by a straight line passing through the point $\dots\dots\dots$

- (a) (0, 3) (b) (0, 0) (c) (3, 0) (d) (3, 3)
-

21 If the point $(3, a - 2)$ lies on the line representing the function f where $f(x) = 4x - 3$ What is the value of a ?

- (a) 11 (b) 7 (c) 3 (d) $\frac{7}{2}$
-

22 The straight line that represents the function f where $f(x) = x + 1$ cuts the y -axis at the point $\dots\dots\dots$

- (a) (1, 0) (b) (0, 1) (c) (-1, 0) (d) (0, -1)
-

23 If $f(x) = 5$ is represented by a straight line parallel to the x -axis, it passes through the point $\dots\dots\dots$

- (a) (0, 5) (b) (5, 0) (c) (5, -5) (d) (0, 0)
-

24 If $(2, b)$ belongs to the function f where $f(x) = 3x - 6$ What is the value of b ?

- (a) 0 (b) 7 (c) 9 (d) 2
-

25 If $f(x + 2) = x - 2$, then $f(5) = \dots\dots\dots$

- (a) 1 (b) 2 (c) 3 (d) 7
-

26 If $f(3) = 15$, $f(x) = 4x + b$ what is the value of b ?

- (a) 156 (b) 3 (c) 4 (d) -3
-

27 The solution set of the equation: $3(\sqrt{2}x - 3) = 11$ in $\mathbb{R}$ is $\dots\dots\dots$

- (a) $\left\{\frac{20\sqrt{2}}{3}\right\}$ (b) $\{10\sqrt{2}\}$ (c) $\left\{\frac{10\sqrt{2}}{3}\right\}$ (d) $\left\{\frac{10}{3}\right\}$
-

28 The solution set of the inequality : $-1 \leq 4 - X < 1$ in $\mathbb{R}$ is

- (a) $]3, 5]$ (b) $[3, 5[$ (c) $]3, 5[$ (d) $[3, 5]$

29 The solution set of the inequality : $-2 < 3X + 7 \leq 10$ in $\mathbb{R}$ is

- (a) $] -3, 1]$ (b) $]1, 3]$ (c) $[-3, 1[$ (d) $] -3, 1[$

30 If $-2 < X < 2$, then $2X + 1$ belongs to

- (a) $] -3, 5[$ (b) $[-3, 5]$ (c) $] -3, 3[$ (d) $] -2, 2[$

Second Essay questions

1 In each of the following, find the values of X, y if :

- ① $(X + 5, 3) = (5, 3y + 1)$ ② $(X^2, y + 1) = (64, \sqrt[3]{-64})$
 ③ $(\sqrt{X} - 3, 7) = (5, y^2 - 2)$

2 If $(4a, -6) = (20, b - 3)$, find the value of : $\sqrt{a^2 - b^2}$

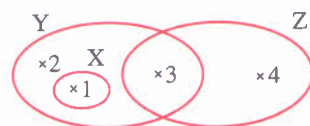
3 If $X = \{3, 4\}$, $Y = \{4, 5\}$, $Z = \{5, 6\}$, find :

- ① $X \times (Y \cap Z)$ ② Y^2 ③ $n(X^2)$

4 Using the given Venn diagram for sets X, Y, Z

Find : ① $(X \cap Y) \times Z$

② $(X \cup Y) \times (Z - Y)$



5 If $X \times Y = \{(1, 1), (1, 5), (1, 3), (4, 1), (4, 5), (4, 3)\}$ Find :

- ① $Y \times X$ ② X, X^2

6 If $X = \{1, 2, 3, 5\}$, $Y = \{3, 5, 6\}$ Find :

- ① $(Y \cap X) \times Y$ ② $n(Y^2)$

7 If $X = \{-4, -2, 0, 2, 4\}$ and R was a relation on X where « $X R y$ » means that «the number X is the additive inverse of the number y » for each $X \in X, y \in X$. Write R as a set of ordered pairs and represent it with an arrow diagram. Is R a function or not ?

- 8 If $X = \{2, 3, 5\}$, $Y = \{4, 6, 8, 10\}$ and R was a relation from X to Y where « $X R y$ » means « $X = \frac{1}{2} y$ » for each $X \in X$, $y \in Y$ write R as a set of ordered pairs and represent it in the cartesian diagram. Then show that R is a function and find its range.
-
- 9 If $X = \{1, 3, 4\}$, $Y = \{1, 2, 3\}$ and R was a relation from X to Y where « $X R y$ » means that « $(X + y)$ is an odd number» for each $X \in X$, $y \in Y$
- ① Write R as a set of ordered pairs and represent it with an arrow diagram.
 - ② If $2 X R 3$, **find** : The value of X
-
- 10 If $X = \{2, 3, 4\}$, $Y = \{6, 9, 12, 15\}$ and R was a relation from X to Y where « $X R y$ » means that « $y = 3 X$ » for each $X \in X$, $y \in Y$ write R as a set of ordered pairs and represent it in an arrow diagram. Is R a function from X to Y ?
-
- 11 If $X = \{0, 1, 2, 3\}$, $Y = \{-1, 0, 1, 4, 9\}$ and was $R : X \longrightarrow Y$ where « $X R y$ » means that « $X = \sqrt{y}$ » for each $X \in X$, $y \in Y$ write R as a set of ordered pairs and represent it in an arrow diagram. Is R a function or not? why?
-
- 12 If $X = \{-1, 1, 2\}$, $Y = \{2, 4, 6, 8\}$ and R was a relation from X to Y where « $X R y$ » means « $y = 2 X + 4$ » for each $X \in X$, $y \in Y$ write R as a set of ordered pairs and represent it in an arrow diagram. Is R a function and why?
-
- 13 If $X = \{X : X \in \mathbb{N}, 0 \leq X \leq 2\}$ and R is a relation on X where « $X R y$ » means « $(X + y)$ is divisible by 3» for each $X \in X$, $y \in X$ write R as a set of ordered pairs and represent it in an arrow diagram, does R represent a function or not?
-
- 14 If $X = \{1, 3, 5\}$ and R is a function on X and $R = \{(a, 3), (5, 3), (b, 5)\}$ **so find** :
- ① The range of the function.
 - ② The value of : $a - b$
-
- 15 If $f(X) = 2X^2 - 5X + 2$, **prove that** : $f(2) = f\left(\frac{1}{2}\right)$
-
- 16 If $f(X) = X^2 - 3X$, $g(X) = X - 3$
- ① **Find** : $f(\sqrt{2}) + 3g(\sqrt{2})$
 - ② **Prove that** : $f(3) = g(3) = 0$
-
- 17 If $X = \{0, 1, 3\}$, $Y = \{1, 2, 3, 4, 5, 7\}$ and $f : X \longrightarrow Y$ where $f(X) = 5 - X$
- ① Find the range of the function f
 - ② Represent the graphically function f

18 If $R = \{(1, 3), (2, 5), (3, 7), (4, 9), (5, 11)\}$

① Write the domain of the function R

② Write the range of the function R

19 If the straight line representing the function f where $f(x) = 4x - a$ intersects the x -axis at the point $(2, b)$, find : value of a, b

20 If the straight line representing the function f where $f(x) = ax - 3$ intersects the x -axis at the point $(3, 0)$ find the value of : a , then find the value of $f(5)$

21 Represent graphically each of the following functions :

① $f(x) = 2$

② $f(x) = 0$

③ $f(x) = -1$

22 Represent graphically each of the following functions :

① $f(x) = 3x$

② $f(x) = x + 3$

③ $f(x) = 2x + 1$

④ $f(x) = 3 - \frac{1}{2}x$

23 Find the solution set for each of the following equations in $\mathbb{R}$:

① $2x - \sqrt{2} = 7\sqrt{2}$

② $5(2x + 3) - 3x = x - 3$

③ $3 - \sqrt{7}x = |-17|$

24 Find the solution set for each of the following inequalities in $\mathbb{R}$ and then represent each on the number line :

① $x - 4 < 11$

② $5 - 3x > 11$

③ $2x + 9 > 5x - 3$

④ $x - 4 \geq -2x + 5$

⑤ $9 \geq 2x + 3 > 1$

⑥ $\frac{x}{3} + 2 > 3$

⑦ $4x < 5x + 2 < 4x + 3$

⑧ $x + 3 \geq 3x - 1 > 2x - 2$

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

اختبار شهر مارس



1- Choose the correct answer:

2

- a What is the second proportional for the numbers 4 , 6 , 12? (18 , 8 , 6 , 2)
- b If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d} =$ ($\frac{4}{3}$, $\frac{4}{9}$, $\frac{1}{3}$, $\frac{2}{3}$)

2- Answer each of the following:

8

- a If $X = \{5\}$, $Y = \{2, 3\}$, $Z = \{2, 4, 5\}$, find each of the following:

(1) $Y \times (Y \cup Z)$ (2) $(X \cap Z) \times (Y \cap Z)$ (3) $(Z - Y) \times (Z - X)$

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- b If $f(x) = 2x + 3$ and $f(k) = 11$, find the value of k:

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- c If $x, y, 27$ are in proportion, and $x - y = 30$, find each of x, y

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- d Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line.:

$$6 - 3y \leq 2(y - 2)$$

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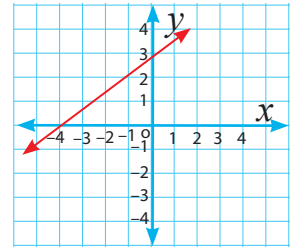
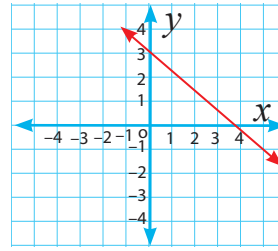
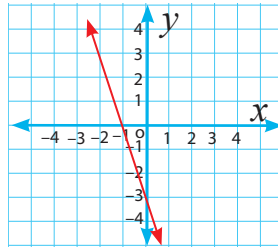
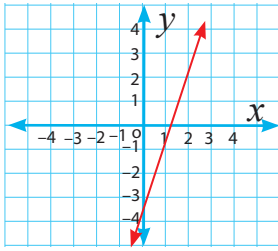
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1- Choose the correct answer:

2

- a Which of the following graphs represent the function: $f(x)=3x-4$?



- b If $(a, 3) = (-2, b)$, then $a + b = \dots\dots\dots$ $(-5, -1, 1, 5)$

2- Answer each of the following:

8

- a If $\frac{2x+3}{2x-3} = \frac{2y+5}{2y-5}$, then prove that: $\frac{x}{y} = \frac{3}{5}$

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- b Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line:

$$1 \leq 4 - 3(x - 1) < 13$$

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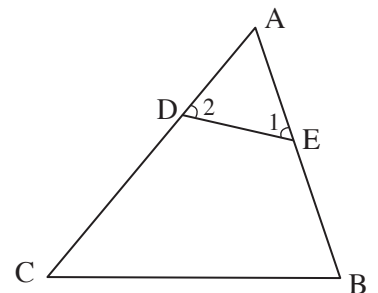
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- c In the following figure:

$$AC > AB, m(\angle 1) = m(\angle 2)$$

prove that: $DC > EB$



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- d Find the number which if added to each of the numbers: 7 , 12 , 11 , 18 they become proportional numbers:

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1- Choose the correct answer:

2

- a If $f(x) = x^2$, $g(x) = x + 4$, what is the value of: $5f(2) + 2g(5)$?
(18 , 20 , 70 , 38)
- b In ΔABC : $1 \dots\dots\dots \frac{AB+BC}{AC}$ (> , < , = , $\geq$)

2- Answer each of the following:

8

- a If $x : y = 2 : 5$, find the value of: $(10x + 3y) : (5x + 2y)$
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- b If: $\frac{x+y}{7} = \frac{y+Z}{5} = \frac{x+Z}{8}$, find the value of: $\frac{x+y+Z}{x-Z}$
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.....
.....
.....
- c If $X \times Y = \{(3,3), (4,3), (3,7), (4,7), (3,8), (4,8)\}$, find each of the following
- (1) X, Y (2) $Y \times (X \cap Y)$ (3) $(X - Y) \times (Y - X)$
(4) $n(Y^2)$ (5) $n(X^2)$
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d If R is a relation from X to Y and $R = \{(2,2), (0,2), (3,1), (4,2)\}$:

- (1) Write the relation in a table form.
- (2) Represent the relation graphically
- (3) Find the domain and the range of the relation

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1- Choose the correct answer:

- a What is the second proportional for the numbers 4 , 6 , 12? (18 , 8 , 6 , 2)
- b If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d} =$ ($\frac{4}{3}$, $\frac{4}{9}$, $\frac{1}{3}$, $\frac{2}{3}$)

2- Answer each of the following:

- a If $X = \{5\}$, $Y = \{2, 3\}$, $Z = \{2, 4, 5\}$, find each of the following:

(1) $Y \times (Y \cup Z)$ (2) $(X \cap Z) \times (Y \cap Z)$ (3) $(Z - Y) \times (Z - X)$

(1) $Y \times (Y \cup Z) = \{2, 3\} \times \{2, 3, 4, 5\}$
 $= \{(2, 2), (2, 3), (2, 4), (2, 5), (3, 2), (3, 3), (3, 4), (3, 5)\}$

(2) $(X \cap Z) \times (Y \cap Z) = \{5\} \times \{2\} = \{(5, 2)\}$

(3) $(Z - Y) \times (Z - X) = \{4, 5\} \times \{2, 4\}$
 $= \{(4, 2), (4, 4), (5, 2), (5, 4)\}$

- b If $f(x) = 2x + 3$ and $f(k) = 11$, find the value of k:

$\therefore f(x) = 2x + 3, f(k) = 11$

$\therefore 2(k) + 3 = 11$

$\therefore 2(k) = 11 - 3$

$\therefore 2(k) = 8 (\div 2)$

$\therefore k = 4$

- c If $x, y, 27$ are in proportion, and $x - y = 30$, find each of x, y

$\therefore x, y, 27$ are in proportion

$\therefore \frac{x}{y} = \frac{y}{27}$

$\therefore \frac{x - y}{y - 27} = \frac{y}{27}$

$\therefore \frac{30}{y - 27} = \frac{y}{27}$

$\therefore y^2 - 27y = 810$

$\therefore y^2 - 27y - 810 = 0$

$\therefore (y - 45)(y + 18) = 0$

$\therefore y = 45$ or $y = -18$

$\therefore x = 75$ or $x = 12$

- d Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line.:

$$6 - 3y \leq 2(y - 2)$$

$$\therefore 6 - 3y \leq 2(y - 2)$$

$$\therefore 6 - 3y \leq 2y - 4$$

$$\therefore -3y - 2y \leq -4 - 6$$

$$\therefore -5y \leq -10$$

$$\therefore -5y \leq -10 (\div -5)$$

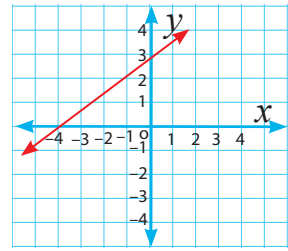
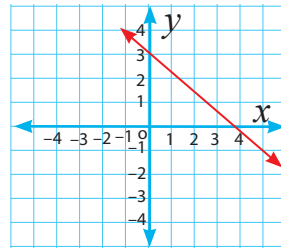
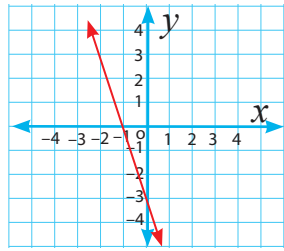
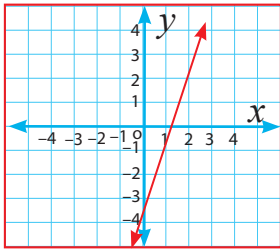
$$\therefore y \geq 2$$

$$\therefore \text{The solution set} = [2, \infty[$$



1- Choose the correct answer:

- a Which of the following graphs represent the function: $f(x)=3x-4$?



- b If $(a, 3) = (-2, b)$, then $a + b = \dots\dots\dots$ (-5 , -1 , 1 , 5)

2- Answer each of the following:

- a If $\frac{2x+3}{2x-3} = \frac{2y+5}{2y-5}$, then prove that: $\frac{x}{y} = \frac{3}{5}$

$$\therefore \frac{2x+3}{2x-3} = \frac{2y+5}{2y-5}$$

$$\therefore (2x+3)(2y-5) = (2x-3)(2y+5)$$

$$\therefore 4xy - 10x + 6y - 15 = 4xy + 10x - 6y - 15$$

$$\therefore -10x - 10x + 6y + 6y = 0$$

$$\therefore -20x = -12y \quad \therefore \frac{x}{y} = \frac{-12}{-20} = \frac{3}{5}$$

- b Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line:

$$1 \leq 4 - 3(x - 1) < 13$$

$$\therefore 1 \leq 4 - 3(x - 1) < 13$$

$$\therefore 1 \leq 4 - 3x + 3 < 13$$

$$\therefore 1 \leq -3x + 7 < 13$$

$$\therefore 1 - 7 \leq -3x < 13 - 7$$

$$\therefore -6 \leq -3x < 6$$

$$\therefore \frac{-6}{-3} \geq \frac{-3}{-3}x > \frac{6}{-3}$$

$$\therefore 2 \geq x > -2$$

$$\therefore \text{The solution set} =] -2, 2]$$



c In the following figure:

$$AC > AB, m(\angle 1) = m(\angle 2)$$

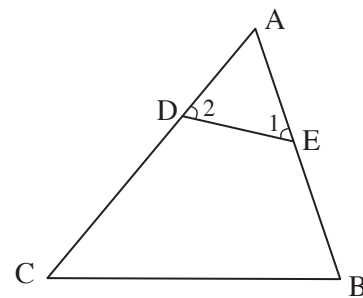
prove that: $DC > EB$

$$\therefore m(\angle 1) = m(\angle 2) \quad \therefore AD = AE$$

$$\therefore AC > AB$$

$$\therefore AC - AD > AB - AE$$

$$\therefore DC > EB$$



d Find the number which if added to each of the numbers: 7, 12, 11, 18 they become proportional numbers:

Let the number is m .

$$\therefore \frac{7+m}{12+m} = \frac{11+m}{18+m} \quad \therefore (7+m)(18+m) = (12+m)(11+m)$$

$$\therefore 126 + 25m + m^2 = 132 + 23m + m^2$$

$$\therefore 25m - 23m = 132 - 126$$

$$\therefore 2m = 6 \quad \therefore m = 3$$

$\therefore$ The number is 3.

1- Choose the correct answer:

- a If $f(x) = x^2$, $g(x) = x + 4$, what is the value of: $5f(2) + 2g(5)$?
(18 , 20 , 70 , **38**)
- b In ΔABC : $1 \dots\dots\dots \frac{AB+BC}{AC}$
(**>** , < , = , $\geq$)

2- Answer each of the following:

- a If $x : y = 2 : 5$, find the value of: $(10x + 3y) : (5x + 2y)$
- $\therefore x : y = 2 : 5 \quad \therefore \frac{x}{2} = \frac{y}{5}$ assuming that: $\frac{x}{2} = \frac{y}{5} = k$
- $\therefore x = 2k, y = 5k$
- $\therefore \frac{10x + 3y}{5x + 2y} = \frac{10(2k) + 3(5k)}{5(2k) + 2(5k)}$
- $= \frac{20k + 15k}{10k + 10k} = \frac{35k}{20k} = \frac{7}{4}$
- $\therefore (10x + 3y) : (5x + 2y) = 7 : 4$
- b If: $\frac{x+y}{7} = \frac{y+Z}{5} = \frac{x+Z}{8}$, find the value of: $\frac{x+y+Z}{x-Z}$

By adding the antecedents and consequents of the three ratios:

$$\frac{x+y+y+Z+x+Z}{7+5+8} = \frac{2x+2y+2Z}{20}$$

$$= \frac{x+y+Z}{10} = \text{one of the ratios} \quad (1)$$

By multiplying the terms of 2nd ratio by (-1) and add the antecedents and consequents of 1st and 2nd ratios:

$$\frac{x+y-y-Z}{7-5} = \frac{x-Z}{2} = \text{one of the ratios} \quad (2)$$

From (1) and (2):

$$\frac{x+y+Z}{10} = \frac{x-Z}{2}$$

$$\frac{x+y+Z}{x-Z} = \frac{10}{2} = 5$$

c If $X \times Y = \{(3,3), (4,3), (3,7), (4,7), (3,8), (4,8)\}$, find each of the following

(1) X, Y (2) $Y \times (X \cap Y)$ (3) $(X - Y) \times (Y - X)$

(4) $n(Y^2)$ (5) $n(X^2)$

(1) $X = \{3, 4\}, Y = \{3, 7, 8\}$

(2) $Y \times (X \cap Y) = \{3, 7, 8\} \times \{3\} = \{(3, 3), (7, 3), (8, 3)\}$

(3) $(X - Y) \times (Y - X) = \{4\} \times \{7, 8\} = \{(4, 7), (4, 8)\}$

(4) $n(Y^2) = n(Y) \times n(Y) = 3 \times 3 = 9$

(5) $n(X^2) = n(X) \times n(X) = 2 \times 2 = 4$

d If R is a relation from X to Y and $R = \{(2,2), (0,2), (3,1), (4,2)\}$:

(1) Write the relation in a table form.

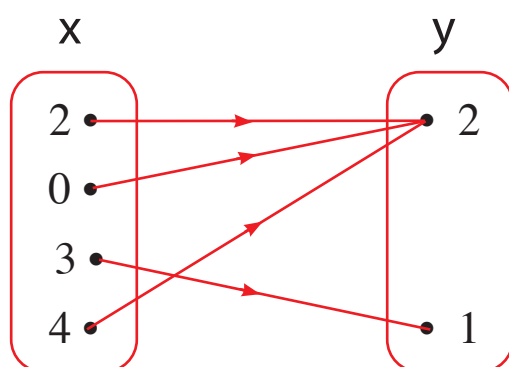
(2) Represent the relation graphically

(3) Find the domain and the range of the relation

(1) In the table form

x	2	0	3	4
y	2	2	1	2

(2)



(3) The domain = $\{2, 0, 3, 4\}$, The range = $\{2, 1\}$

حمل الآن

مجانا وحصريا

المراجعة رقم (3)

اختبار شهر مارس



Q1: Choose the correct answer

1 If $\frac{a}{4} = \frac{b}{3}$, What's the value of $\frac{a+b}{a-b}$?

(a) $\frac{7}{4}$

(b) $\frac{4}{3}$

(c) $\frac{1}{7}$

(d) 7

2 If a, b, 2, 3 are proportional, then $\frac{b}{a} = \dots\dots\dots$

(a) $\frac{3}{2}$

(b) $\frac{2}{3}$

(c) 3

(d) 2

3 If $4x^2 = 9y^2$, then $\frac{x}{y} = \dots\dots\dots$

(a) $\frac{9}{4}$

(b) $\frac{3}{2}$

(c) $\pm \frac{3}{2}$

(d) $\pm \frac{2}{3}$

4 If $5a - 4b = 0$, then $\frac{a}{b} = \dots\dots\dots$

(a) $\frac{4}{5}$

(b) $\frac{5}{4}$

(c) $\frac{-4}{5}$

(d) $\frac{-5}{4}$

5 If $\frac{4}{x} = \frac{7}{y} = \frac{b}{y-x}$, then b =

(a) 3

(b) -3

(c) 11

(d) -11

6 If $\frac{a}{b} = \frac{c}{d} = k$ where $k \neq 0$, then $\frac{a \times c}{b \times d} = \dots\dots\dots$

(a) $2k^2$

(b) k^2

(c) k

(d) 2k

7 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

(a) 9

(b) 13

(c) 14

(d) 8

8 The positive middle proportional between a and b is

(a) $\sqrt{ab}$

(b) $-\sqrt{ab}$

(c) $\pm\sqrt{ab}$

(d) ab

9 The third proportional of 9 and -12 is

(a) -16

(b) 8

(c) 16

(d) 108



10 The middle proportional between 5 and 20 is

- (a) 10 (b) -10 (c) 100 (d) ± 10

11 The middle proportional between $(x - 2)$ and $(x + 2)$ is

- (a) $\sqrt{x + 2}$ (b) $\sqrt{x^2 - 4}$ (c) $x^2 - 4$ (d) $\pm \sqrt{x^2 - 4}$

12 If a, 3, 9, b are continued proportional quantities, find the value of: $b + a =$

- (a) 3 (b) 9 (c) 27 (d) 28

13 If $\frac{a}{5} = \frac{b}{7}$, then $7a - 5b + 3 =$

- (a) 3 (b) 7 (c) 5 (d) 2

14 If a, x, b and $2x$ are proportional quantities, then $a : b =$

- (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 1 : 4

15 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then the value of $\frac{a + d}{d} =$

- (a) 5 (b) 7 (c) 8 (d) 9

16 If $\frac{a}{b} = \frac{c}{d} = \frac{3}{5}$, then $\frac{a + c}{b + d} =$

- (a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $\frac{6}{5}$ (d) $\frac{5}{6}$

17 If a is the first proportional for the numbers 4 and 16, what is the value of a?

- (a) 1 (b) 2 (c) 4 (d) 8

18 What is the fourth proportional for the quantities 2, 4, 5?

- (a) 12 (b) 10 (c) 3 (d) 6



19 If 6 is the middle proportional between m and 2, then m =

(a) 8

(b) 12

(c) 18

(d) 36

20 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, then a =

(a) 5×2^2

(b) 40

(c) 10

(d) 2×5^3

21 If a, 2, 4, b are in a continued proportional, then a + b =

(a) 1

(b) 8

(c) 7

(d) 9

22 If x, 4, y, 5 are proportional quantities, then x : y =

(a) 4 : 5

(b) 5 : 4

(c) 4 : 1

(d) 5 : 1

23 The number that must be added to the numbers 1, 3, 6 to be in a continued proportional is

(a) 1

(b) 2

(c) 3

(d) 4

24 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

(a) 9

(b) 14

(c) 13

(d) 8

25 What's the third proportional for $x^4, 2x^3$?

(a) $2x^2$ (b) $2x$ (c) $4x^3$ (d) $4x^2$

26 If: $3a = 5b = 4c$, then a : b : c equals

(a) 9 : 12 : 16

(b) 20 : 12 : 15

(c) 15 : 10 : 9

(d) 8 : 5 : 3





$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

Q2: Answer The Following

1 Find the value of x if the numbers x, 24 and 144 are proportional.

2 Find the number that if added to the numbers 3, 5, 9, and 13 it becomes proportional.

3 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, find the value of: $\frac{x-y+z}{2x+y}$.

4 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{4b+7d}{4b+7c} = \frac{5b-8d}{5a-8c}$$

5 The mean proportional between the numbers 3 and 48 equals.....





$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

6 If b is the middle proportional between a and c , Prove that: $\frac{3a + 4b}{3b + 4c} = \frac{a}{b}$

7 If $\frac{x-2y}{x+3y} = \frac{1}{3}$, Find the value of $\frac{y}{x}$

8 If $4, a, \frac{1}{9b^2}$ are in continued proportion. Find the value of ab

9 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{a+b}{b} = \frac{c+d}{d}$$

10 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, and $x + y - 2z = 12$ Find the value of z



11 If b is the middle proportional between a and c , Prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

12 Find the value of x , y if the quantities 2, x , y and 54 are in a continued proportion.

13 Find the number that if added to the two terms of the ratio 7 : 11 it becomes 2 : 3

14 If $\frac{a+b}{b} = \frac{c+d}{d} = \frac{c+d}{d}$, Find the value of $\frac{x+y+z}{x-y}$



Q1: Choose the correct answer

1 If $(a + 5, 3) = (8, b - 1)$ then $\sqrt{a^2 + b^2}$

(a) 7

(b) 3

(c) 9

(d) 5

2 If $n(X^2) = 9$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

(a) 2

(b) 3

(c) 4

(d) 8

3 If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

(a) 3

(b) ± 3

(c) 9

(d) ± 9

4 If $n(X) = 2$ and $Y = \{1, 2\}$, then $n(X \times Y) = \dots\dots\dots$

(a) 4

(b) 3

(c) 5

(d) 6

5 If $(3, 5) \in \{(3, x), (3, 8), (6, 8)\}$, then $X = \dots\dots\dots$

(a) 8

(b) 3

(c) 5

(d) 6

6 If $X = \{1, 2\}$ and $Y = \{3, 4\}$, then $(3, 4) \in \dots\dots\dots$

(a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

7 If $X = \{2\}$ and $Y = \{3\}$, then $X \times Y = \dots\dots\dots$

(a) 6

(b) $\{6\}$ (c) $(2, 3)$ (d) $\{(2, 3)\}$

8 If $X = \{3, 4\}$, then $n(X \times \emptyset) = \dots\dots\dots$

(a) 0

(b) 1

(c) 2

(d) $\emptyset$

9 If $n(X \times Y) = 6$ and $Y = \{2\}$, then $n(X^2) = \dots\dots\dots$

(a) 4

(b) 9

(c) 16

(d) 36



9 If the point $(a, 5) \in Y$ -axis, then $a = \dots\dots\dots$

- (a) 0 (b) 5 (c) -5 (d) 25

10 If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $x - y = \dots\dots\dots$

- (a) 1 (b) -1 (c) ± 1 (d) 0

11 If the point $(3, b - 5)$ lies on the x -axis, then $2b + 1 = \dots\dots\dots$

- (a) Zero (b) 5 (c) 11 (d) 8

12 What is the S.S. for the inequality: $3 \geq x > -3$ in R ?

- (a) $] -3, 3[$ (b) $] -3, 3]$ (c) $[-3, 3[$ (d) $[-3, 3]$

13 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to?

- (a) $N \times N$ (b) $Z \times Z$ (c) $Q \times Q$ (d) $R \times R$

14 If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- (a) 8 (b) 9 (c) 11 (d) 12

15 If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y where:
 $R = \{(5, 9), (8, 9), (k, 9)\}$, what is the value of k ?

- (a) 5 (b) 7 (c) 8 (d) 9

16 If $(k^2 - 4, k)$ lies on the negative direction of Y -axis, then $k = \dots\dots\dots$

- (a) 2 (b) ± 2 (c) -2 (d) 0

17 If $f(x + 3) = x - 3$, then $f(7) = \dots\dots\dots$

- (a) 4 (b) 1 (c) 7 (d) 10

18 If $f(x) = 3$, then $f(-5) - f(5) = \dots\dots\dots$

- (a) 6 (b) 1 (c) zero (d) -1



19 What is the S.S. for the inequality: $5x \leq 25$ in $\mathbb{R}$?

- (a) $]-\infty, 5[$ (b) $]5, \infty[$ (c) $[5, \infty[$ (d) $]-\infty, 5]$

20 If $f(x) = 4$, then $f(4) \div f(10) = \dots\dots\dots$

- (a) 4 (b) $\frac{2}{5}$ (c) 1 (d) 10

21 If $R = \{(1,3), (2,5), (4,3)\}$ represent a function, then its domain = $\dots\dots\dots$

- (a) $\{1, 2, 4\}$ (b) $\{3, 5, 4\}$ (c) $\mathbb{Z}$ (d) $\mathbb{N}$

22 If $f(x) = kx + 8$ and $f(2) = 0$, then $k = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) -4

23 $f(x) = 3x$ is represented by a straight line passes through the point $\dots\dots\dots$

- (a) (3, 3) (b) (3, 0) (c) (0, 0) (d) (0, 3)

24 If $f(x) = 5$, then $f(-3) = \dots\dots\dots$

- (a) 5 (b) -5 (c) -3 (d) -15

25 If $(a, 3)$ lies on the straight line that represents $f(x) = 2x - 5$, then $a = \dots\dots\dots$

- (a) 2 (b) 1 (c) -2 (d) 4

26 If $f(x) = 3x + b$ and $f(4) = 13$, then $b = \dots\dots\dots$

- (a) 1 (b) 2 (c) 0 (d) 3

27 If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?

- (a) 3 (b) 4 (c) 5 (d) 6



28 If $f(x) = x^2$, $g(x) = x + 4$, what is the value of $5f(2) + 2g(5)$?

- (a) 18 (b) 20 (c) 38 (d) 70

29 If $(a, a) \in f$ where $f(x) = 2x + 3$, then $a = \dots\dots\dots$

- (a) 3 (b) -3 (c) 0 (d) 1

30 If R is a relation where $R = \{(1, 7), (2, 8), (3, 7), (5, 8)\}$, Then the range = $\dots\dots\dots$

- (a) $\{1, 2, 3, 5\}$ (b) $\{7, 8, 5\}$ (c) $\{7, 8\}$ (d) $\{1, 2, 7, 8\}$

31 If $(x, 7)$ is located on Y-axis, then $5x + 1 = \dots\dots\dots$

- (a) 0 (b) 1 (c) 5 (d) 6

32 The ordered pair $(1, 2)$ belongs to the function f where: $\dots\dots\dots$

- (a) $f(x) = 2x - 1$ (b) $f(x) = -3x + 7$ (c) $f(x) = 2x + 1$ (d) $f(x) = -3x + 5$

33 The straight line representing the function f where $f(x) = 3x - 12$ cuts the x-axis at the point:

- (a) $(-12, 0)$ (b) $(12, 0)$ (c) $(4, 0)$ (d) $(-4, 0)$

34 What is the solution set of the inequality $-x > 3$ in R ?

- (a) $] -\infty, -3[$ (b) $] -\infty, 3[$ (c) $] -3, \infty[$ (d) $] 3, \infty[$

35 If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?

- (a) -7 (b) -1 (c) 1 (d) 7

36 The interval $[-1, 2[$ is the solution set in R for the inequality: $\dots\dots\dots$

- (a) $-1 < x < 2$ (b) $-1 < x \leq 2$ (c) $-1 \leq x < 2$ (d) $-1 \leq x \leq 2$



37 If the straight line that represents the function $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

(a) -3

(b) 2

(c) 0

(d) 3

38 What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

(a) $[-5, 3]$ (b) $] -5, 3 [$ (c) $[-3, 5]$ (d) $] -3, 5 [$

Q2: Answer The Following

1 If $X = \{1, 3, 7\}$, $Y = \{5, 9\}$, find $X \times Y$, Y^2

2 Find the solution set for each of the following inequalities in $\mathbb{R}$:

(a) $2x + 3 < 6$ (b) $5 - 3x \geq 2$

(c) $11 > 3x + 2 > -4$ (d) $-8 \leq 4 - 3(x + 1) < 10$

3 Represent graphically the function f where $f(x) = 3x - 1$



- 4 If $X = \{0, 1, 2, 3\}$, $Y = \{6, 7, 8, 9, 10\}$ and R is a relation from X to Y where " xRy " means " $x+y = 10$ " for every $x \in X$, $y \in Y$ write the relation as a set of ordered pairs, then represent the relation with an arrow diagram stating the domain and the range of the relation. Does the relation represent a function or not? why?

- 5 If $f(x) = 2x + 3$ and $f(k) = 11$, find the value of k

- 6 If $f(x) = 2x^2 - 5x + 2$, prove that $f(2) = f\left(\frac{1}{2}\right)$

- 7 If the straight line which represents the function $f(x) = ax + b$ intersects X-axis at $(3, 0)$ and Y-axis at $(0, -3)$, find the value of a and b

- 8 If $X \times Y = \{(2, 3), (2, 6), (2, 7)\}$, Find:

☐ a X and Y.

☐ b Y^2

☐ c $n(X^2)$



9 If $X = \{1, 3, 5\}$ and R is a function on X , and relation R is $\{(a, 3), (b, 1), (1, 5)\}$. Find:

- (a) The range of the function
(b) The numerical value of the expression: $a + b$

10 Find the solution set of the inequality: $-3 < 2x + 5 < 13$ in R .

11 If $X = \{1, 2\}$, $Y = \{2, 3, 4\}$, find:

- (a) $(X \cap Y) \times X$
(b) $(X - Y) \times Y$
(c) $n(X^2)$

12 If $X = \{2, 1, 0, -1, -2\}$, and R is a relation on X , where aRb means (a is the additive inverse of b) for every $a, b \in X$.

Write the relation R and represent it with a Cartesian diagram.

13 If the straight line for the function $f: R \rightarrow R$ where $f(x) = 6x - a$ cuts Y-axis at the point $(b, 3)$. Find the value of $2a + 7b$.



14 If $(x + 3, 8) = (5, 2y)$, then find the value of x and y .

15 If $x = \{1, 3, 4, 5\}$, $y = \{1, 2, 3, 4, 5, 6\}$ and R is a relation from X to Y where " aRb " means " $a + b = 7$ " for each $a \in X$, $b \in Y$

- a Write R and represent it with an arrow diagram.
- b Show if R is a function or not, and why? If it is a function, find its range.

16 If R is a relation from X to Y and $R = \{(2, 2), (0, 2), (3, 1), (4, 2)\}$

- a Write the relation in a table form.
- b Represent the relation graphically.
- c Find the domain and the range of the relation



Q1: Choose the correct answer

1 If $\frac{a}{4} = \frac{b}{3}$, What's the value of $\frac{a+b}{a-b}$?

☐ a $\frac{7}{4}$

☐ b $\frac{4}{3}$

☐ c $\frac{1}{7}$

☒ d 7

2 If a, b, 2, 3 are proportional, then $\frac{b}{a} = \dots\dots\dots$

☒ a $\frac{3}{2}$

☐ b $\frac{2}{3}$

☐ c 3

☐ d 2

3 If $4x^2 = 9y^2$, then $\frac{x}{y} = \dots\dots\dots$

☐ a $\frac{9}{4}$

☐ b $\frac{3}{2}$

☒ c $\pm \frac{3}{2}$

☐ d $\pm \frac{2}{3}$

4 If $5a - 4b = 0$, then $\frac{a}{b} = \dots\dots\dots$

☒ a $\frac{4}{5}$

☐ b $\frac{5}{4}$

☐ c $\frac{-4}{5}$

☐ d $\frac{-5}{4}$

5 If $\frac{4}{x} = \frac{7}{y} = \frac{b}{y-x}$, then b =

☒ a 3

☐ b -3

☐ c 11

☐ d -11

6 If $\frac{a}{b} = \frac{c}{d} = k$ where $k \neq 0$, then $\frac{a \times c}{b \times d} = \dots\dots\dots$

☐ a $2k^2$

☒ b k^2

☐ c k

☐ d 2k

7 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

☐ a 9

☒ b 13

☐ c 14

☐ d 8

8 The positive middle proportional between a and b is

☒ a $\sqrt{ab}$

☐ b $-\sqrt{ab}$

☐ c $\pm\sqrt{ab}$

☐ d ab

9 The third proportional of 9 and -12 is

☐ a -16

☐ b 8

☒ c 16

☐ d 108



10 The middle proportional between 5 and 20 is

(a) 10

(b) -10

(c) 100

(d) ± 10

11 The middle proportional between $(x - 2)$ and $(x + 2)$ is

(a) $\sqrt{x + 2}$

(b) $\sqrt{x^2 - 4}$

(c) $x^2 - 4$

(d) $\pm \sqrt{x^2 - 4}$

12 If $a, 3, 9, b$ are continued proportional quantities, find the value of: $b + a = \dots\dots\dots$

(a) 3

(b) 9

(c) 27

(d) 28

13 If $\frac{a}{5} = \frac{b}{7}$, then $7a - 5b + 3 = \dots\dots\dots$

(a) 3

(b) 7

(c) 5

(d) 2

14 If a, x, b and $2x$ are proportional quantities, then $a : b = \dots\dots\dots$

(a) 1 : 2

(b) 2 : 1

(c) 1 : 3

(d) 1 : 4

15 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then the value of $\frac{a + d}{d} = \dots\dots\dots$

(a) 5

(b) 7

(c) 8

(d) 9

16 If $\frac{a}{b} = \frac{c}{d} = \frac{3}{5}$, then $\frac{a + c}{b + d} = \dots\dots\dots$

(a) $\frac{5}{3}$

(b) $\frac{3}{5}$

(c) $\frac{6}{5}$

(d) $\frac{5}{6}$

17 If a is the first proportional for the numbers 4 and 16, what is the value of a ?

(a) 1

(b) 2

(c) 4

(d) 8

18 What is the fourth proportional for the quantities 2, 4, 5?

(a) 12

(b) 10

(c) 3

(d) 6



19 If 6 is the middle proportional between m and 2, then m =

(a) 8

(b) 12

(c) 18

(d) 36

20 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, then a =

(a) 5×2^2

(b) 40

(c) 10

(d) 2×5^3

21 If a, 2, 4, b are in a continued proportional, then a + b =

(a) 1

(b) 8

(c) 7

(d) 9

22 If x, 4, y, 5 are proportional quantities, then x : y =

(a) 4 : 5

(b) 5 : 4

(c) 4 : 1

(d) 5 : 1

23 The number that must be added to the numbers 1, 3, 6 to be in a continued proportional is

(a) 1

(b) 2

(c) 3

(d) 4

24 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

(a) 9

(b) 14

(c) 13

(d) 8

25 What's the third proportional for x^4 , $2x^3$?

(a) $2x^2$ (b) $2x$ (c) $4x^3$ (d) $4x^2$

26 If: $3a = 5b = 4c$, then a : b : c equals

(a) 9 : 12 : 16

(b) 20 : 12 : 15

(c) 15 : 10 : 9

(d) 8 : 5 : 3



Q2: Answer The Following

- 1 Find the value of x if the numbers x, 24 and 144 are proportional.

$$x = 4$$

- 2 Find the number that if added to the numbers 3, 5, 9, and 13 it becomes proportional.

Number is 3

- 3 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, find the value of: $\frac{x - y + z}{2x + y}$.

$$\frac{2}{5}$$

- 4 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{4b + 7d}{4b + 7c} = \frac{5b - 8d}{5a - 8c}$$

$$\text{Both sides} = \frac{1}{m}$$

- 5 The mean proportional between the numbers 3 and 48 equals.....12 or -12



6 If b is the middle proportional between a and c , Prove that: $\frac{3a + 4b}{3b + 4c} = \frac{a}{b}$

Both sides = m

7 If $\frac{x - 2y}{x + 3y} = \frac{1}{3}$, Find the value of $\frac{y}{x}$

$\frac{2}{9}$

8 If $4, a, \frac{1}{9b^2}$ are in continued proportion. Find the value of ab

$\pm \frac{2}{3}$

9 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{a + b}{b} = \frac{c + d}{d}$$

Both sides = $m + 1$

10 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, and $x + y - 2z = 12$ Find the value of z

$z = -15$



11 If b is the middle proportional between a and c , Prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

Both sides = m^2

12 Find the value of x , y if the quantities 2, x , y and 54 are in a continued proportion.

$x = 6$ and $y = 18$.

13 Find the number that if added to the two terms of the ratio 7 : 11 it becomes 2 : 3

The number is 1

14 If $\frac{a+b}{b} = \frac{c+d}{d} = \frac{c+d}{d}$, Find the value of $\frac{x+y+z}{x-y}$

12



Q1: Choose the correct answer

1 If $(a + 5, 3) = (8, b - 1)$ then $\sqrt{a^2 + b^2}$

☐ a 7☐ b 3☐ c 9☒ d 5

2 If $n(X^2) = 9$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

☐ a 2☐ b 3☒ c 4☐ d 8

3 If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

☒ a 3☐ b ± 3 ☐ c 9☐ d ± 9

4 If $n(X) = 2$ and $Y = \{1, 2\}$, then $n(X \times Y) = \dots\dots\dots$

☒ a 4☐ b 3☐ c 5☐ d 6

5 If $(3, 5) \in \{(3, x), (3, 8), (6, 8)\}$, then $X = \dots\dots\dots$

☐ a 8☐ b 3☒ c 5☐ d 6

6 If $X = \{1, 2\}$ and $Y = \{3, 4\}$, then $(3, 4) \in \dots\dots\dots$

☐ a $X \times Y$ ☐ b $Y \times X$ ☐ c X^2 ☒ d Y^2

7 If $X = \{2\}$ and $Y = \{3\}$, then $X \times Y = \dots\dots\dots$

☐ a 6☐ b $\{6\}$ ☐ c $(2, 3)$ ☒ d $\{(2, 3)\}$

8 If $X = \{3, 4\}$, then $n(X \times \emptyset) = \dots\dots\dots$

☒ a 0☐ b 1☐ c 2☐ d $\emptyset$

9 If $n(X \times Y) = 6$ and $Y = \{2\}$, then $n(X^2) = \dots\dots\dots$

☐ a 4☐ b 9☐ c 16☒ d 36

9 If the point $(a, 5) \in Y$ -axis, then $a = \dots\dots\dots$

☒ a 0

☐ b 5

☐ c -5

☐ d 25

10 If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $x - y = \dots\dots\dots$

☐ a 1

☐ b -1

☒ c ± 1

☐ d 0

11 If the point $(3, b - 5)$ lies on the x-axis, then $2b + 1 = \dots\dots\dots$

☐ a Zero

☐ b 5

☒ c 11

☐ d 8

12 What is the S.S. for the inequality: $3 \geq x > -3$ in R ?

☐ a $] -3, 3[$

☒ b $] -3, 3]$

☐ c $[-3, 3[$

☐ d $[-3, 3]$

13 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to?

☐ a $N \times N$

☐ b $Z \times Z$

☐ c $Q \times Q$

☒ d $R \times R$

14 If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

☐ a 8

☐ b 9

☐ c 11

☒ d 12

15 If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y where:
 $R = \{(5, 9), (8, 9), (k, 9)\}$, what is the value of k ?

☐ a 5

☒ b 7

☐ c 8

☐ d 9

16 If $(k^2 - 4, k)$ lies on the negative direction of Y -axis, then $k = \dots\dots\dots$

☐ a 2

☐ b ± 2

☒ c -2

☐ d 0

17 If $f(x + 3) = x - 3$, then $f(7) = \dots\dots\dots$

☐ a 4

☒ b 1

☐ c 7

☐ d 10

18 If $f(x) = 3$, then $f(-5) - f(5) = \dots\dots\dots$

☐ a 6

☐ b 1

☒ c zero

☐ d -1



19 What is the S.S. for the inequality: $5x \leq 25$ in $\mathbb{R}$?

- (a) $]-\infty, 5[$ (b) $]5, \infty[$ (c) $[5, \infty[$ (d) $]-\infty, 5]$

20 If $f(x) = 4$, then $f(4) \div f(10) = \dots\dots\dots$

- (a) 4 (b) $\frac{2}{5}$ (c) 1 (d) 10

21 If $R = \{(1,3), (2,5), (4,3)\}$ represent a function, then its domain = $\dots\dots\dots$

- (a) $\{1, 2, 4\}$ (b) $\{3, 5, 4\}$ (c) $\mathbb{Z}$ (d) $\mathbb{N}$

22 If $f(x) = kx + 8$ and $f(2) = 0$, then $k = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) -4

23 $f(x) = 3x$ is represented by a straight line passes through the point $\dots\dots\dots$

- (a) (3, 3) (b) (3, 0) (c) (0, 0) (d) (0, 3)

24 If $f(x) = 5$, then $f(-3) = \dots\dots\dots$

- (a) 5 (b) -5 (c) -3 (d) -15

25 If $(a, 3)$ lies on the straight line that represents $f(x) = 2x - 5$, then $a = \dots\dots\dots$

- (a) 2 (b) 1 (c) -2 (d) 4

26 If $f(x) = 3x + b$ and $f(4) = 13$, then $b = \dots\dots\dots$

- (a) 1 (b) 2 (c) 0 (d) 3

27 If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?

- (a) 3 (b) 4 (c) 5 (d) 6



28 If $f(x) = x^2$, $g(x) = x + 4$, what is the value of $5f(2) + 2g(5)$?

(a) 18

(b) 20

(c) 38

(d) 70

29 If $(a, a) \in f$ where $f(x) = 2x + 3$, then $a = \dots\dots\dots$

(a) 3

(b) -3

(c) 0

(d) 1

30 If R is a relation where $R = \{(1, 7), (2, 8), (3, 7), (5, 8)\}$, Then the range = $\dots\dots\dots$

(a) $\{1, 2, 3, 5\}$

(b) $\{7, 8, 5\}$

(c) $\{7, 8\}$

(d) $\{1, 2, 7, 8\}$

31 If $(x, 7)$ is located on Y-axis, then $5x + 1 = \dots\dots\dots$

(a) 0

(b) 1

(c) 5

(d) 6

32 The ordered pair $(1, 2)$ belongs to the function f where: $\dots\dots\dots$

(a) $f(x) = 2x - 1$

(b) $f(x) = -3x + 7$

(c) $f(x) = 2x + 1$

(d) $f(x) = -3x + 5$

33 The straight line representing the function f where $f(x) = 3x - 12$ cuts the x-axis at the point:

(a) $(-12, 0)$

(b) $(12, 0)$

(c) $(4, 0)$

(d) $(-4, 0)$

34 What is the solution set of the inequality $-x > 3$ in R ?

(a) $] -\infty, -3[$

(b) $] -\infty, 3[$

(c) $] -3, \infty[$

(d) $] 3, \infty[$

35 If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?

(a) -7

(b) -1

(c) 1

(d) 7

36 The interval $[-1, 2[$ is the solution set in R for the inequality: $\dots\dots\dots$

(a) $-1 < x < 2$

(b) $-1 < x \leq 2$

(c) $-1 \leq x < 2$

(d) $-1 \leq x \leq 2$



37 If the straight line that represents the function $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

☐ a -3

☐ b 2

☒ c 0

☐ d 3

38 What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

☐ a $[-5, 3]$
☒ b $] -5, 3 [$
☐ c $[-3, 5]$
☐ d $] -3, 5 [$

Q2: Answer The Following

1 If $X = \{1, 3, 7\}$, $Y = \{5, 9\}$, find $X \times Y$, Y^2

$$X \times Y = \{(1, 5), (1, 9), (3, 5), (3, 9), (7, 5), (7, 9)\}$$

$$Y^2 = \{(5, 5), (5, 9), (9, 5), (9, 9)\}$$

2 Find the solution set for each of the following inequalities in $\mathbb{R}$:

☒ a $2x + 3 < 6$

☐ b $5 - 3x \geq 2$

$$]-\infty, \frac{3}{2}[$$

$$]-\infty, 1[$$

☐ c $11 > 3x + 2 > -4$

☐ d $-8 \leq 4 - 3(x + 1) < 10$

$$]-2, 3[$$

$$]-3, 3[$$

3 Represent graphically the function f where $f(x) = 3x - 1$

$$\text{If } x = 0, f(0) = 3(0) - 1 = -1. \text{ Plot point: } (0, -1)$$

$$\text{If } x = 1, f(1) = 3(1) - 1 = 2. \text{ Plot point: } (1, 2)$$

$$\text{If } x = 2, f(2) = 3(2) - 1 = 5. \text{ Plot point: } (2, 5)$$



- 4 If $X = \{0, 1, 2, 3\}$, $Y = \{6, 7, 8, 9, 10\}$ and R is a relation from X to Y where " xRy " means " $x+y = 10$ " for every $x \in X$, $y \in Y$ write the relation as a set of ordered pairs, then represent the relation with an arrow diagram stating the domain and the range of the relation. Does the relation represent a function or not? why?

$$R = \{(0, 10), (1, 9), (2, 8), (3, 7)\}$$

$$\text{Domain: } \{0, 1, 2, 3\}$$

Range: $\{7, 8, 9, 10\}$ Function check: Yes, the relation represents a function because every element in the domain X appears exactly once as a first coordinate.

- 5 If $f(x) = 2x + 3$ and $f(k) = 11$, find the value of k

$$k = 4$$

- 6 If $f(x) = 2x^2 - 5x + 2$, prove that $f(2) = f\left(\frac{1}{2}\right)$

$$f(2) = 0 \text{ and } f\left(\frac{1}{2}\right) = 0$$

- 7 If the straight line which represents the function $f(x) = ax + b$ intersects X -axis at $(3, 0)$ and Y -axis at $(0, -3)$, find the value of a and b

$$a = 1 \text{ and } b = -3.$$

- 8 If $X \times Y = \{(2, 3), (2, 6), (2, 7)\}$, Find:

(a) X and Y .

(b) Y^2

(c) $n(X^2)$

$$X = \{2\}$$

$$Y = \{3, 6, 7\}$$

$$Y^2 = \{(3, 3), (3, 6), (3, 7), (6, 3), (6, 6), (6, 7), (7, 3), (7, 6), (7, 7)\}$$

1



9 If $X = \{1, 3, 5\}$ and R is a function on X , and relation R is $\{(a, 3), (b, 1), (1, 5)\}$. Find:

- (a) The range of the function **Range = $\{3, 1, 5\}$**
 (b) The numerical value of the expression: $a + b$ **8**

10 Find the solution set of the inequality: $-3 < 2x + 5 < 13$ in $\mathbb{R}$.

Solution set = $] -4, 4[$

11 If $X = \{1, 2\}$, $Y = \{2, 3, 4\}$, find:

- (a) $(X \cap Y) \times X$ **$\{(2, 1), (2, 2)\}$**
 (b) $(X - Y) \times Y$ **$\{(1, 2), (1, 3), (1, 4)\}$**
 (c) $n(X^2)$ **4**

12 If $X = \{2, 1, 0, -1, -2\}$, and R is a relation on X , where aRb means (a is the additive inverse of b) for every $a, b \in X$.

Write the relation R and represent it with a Cartesian diagram.

$R = \{(2, -2), (1, -1), (0, 0), (-1, 1), (-2, 2)\}$

13 If the straight line for the function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 6x - a$ cuts Y-axis at the point $(b, 3)$. Find the value of $2a + 7b$.

-6



- 14 If $(x + 3, 8) = (5, 2y)$, then find the value of x and y .

$$x = 2$$

$$y = 4$$

- 15 If $x = \{1, 3, 4, 5\}$, $y = \{1, 2, 3, 4, 5, 6\}$ and R is a relation from X to Y where " aRb " means " $a + b = 7$ " for each $a \in X$, $b \in Y$

- (a) Write R and represent it with an arrow diagram.
 (b) Show if R is a function or not, and why? If it is a function, find its range.

$$R = \{(1, 6), (3, 4), (4, 3), (5, 2)\}$$

Yes, R is a function. This is because every element in the domain X appears exactly once as the first projection (x-coordinate) in the relation.

$$\text{Range} = \{6, 4, 3, 2\}$$

- 16 If R is a relation from X to Y and $R = \{(2, 2), (0, 2), (3, 1), (4, 2)\}$

- (a) Write the relation in a table form. **by yourself**
 (b) Represent the relation graphically. **$(2, 2)$, $(0, 2)$, $(3, 1)$, and $(4, 2)$.**
 (c) Find the domain and the range of the relation **$\{2, 1\}$**



حمل الآن

مجاناً وحصرياً

المراجعة رقم (4)

اختبار شهر مارس



Unit 1

Q1 Choose the correct answer :-

- 1) If $x, 3, 4, 6$ are proportional, what is the value of x ?
 a) 0 b) 1 c) 2 d) 3
- 2) What is the second proportional for the numbers $4, 6, 12$?
 a) 18 b) 8 c) 6 d) 2
- 3) If $7x = 3y$, what is the value of $\frac{y}{x}$?
 a) $\frac{7}{3}$ b) $\frac{3}{10}$ c) $\frac{10}{3}$ d) $\frac{3}{7}$
- 4) If $2x = 7y$, what is the value of $\left(\frac{x}{y}\right)^{-1}$?
 a) $\frac{2}{7}$ b) $\frac{7}{2}$ c) $\frac{49}{4}$ d) $\frac{4}{49}$
- 5) If $5x - 3y = 0$, what is the value of $\frac{x}{y}$?
 a) $\frac{5}{3}$ b) $\frac{3}{5}$ c) $-\frac{3}{5}$ d) $-\frac{5}{3}$
- 6) If $5a, 2, 3b, 7$ are four proportional quantities. What is the value of: $\frac{a}{b}$?
 a) $\frac{3}{7}$ b) $\frac{6}{35}$ c) $\frac{3}{5}$ d) $\frac{3}{2}$
- 7) If $\frac{a}{5} = \frac{b}{3}$, what is the value of: $\frac{a+b}{a-b}$?
 a) $\frac{8}{3}$ b) $\frac{5}{3}$ c) $\frac{1}{4}$ d) 4
- 8) If $\frac{a}{3} = \frac{b}{4}$, what is the value of: $\frac{3a-b}{b-a}$?
 a) $\frac{4}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{5}$ d) 5
- 9) If $\frac{a}{3} = \frac{b}{2}$, what is the value of $(6a - 9b - 1)^{2026}$?
 a) 2026 b) -2026 c) 1 d) -1
- 10) If $\frac{a}{3} = \frac{b}{5}$, $5a - 2b = 20$, what is the value of: b ?
 a) 3 b) 5 c) 15 d) 20

- 11) If $\frac{3a}{5b} = \frac{1}{2}$, what is the value of: $\frac{a}{b}$?
a) $\frac{6}{5}$ b) $\frac{5}{6}$ c) $\frac{2}{3}$ d) $\frac{3}{2}$
- 12) If $4x^2 = 9y^2$, what is the value of: $\frac{x}{y}$?
a) $\frac{9}{4}$ b) $\frac{3}{2}$ c) $\pm \frac{2}{3}$ d) $\pm \frac{3}{2}$
- 13) If $\frac{5a-7b}{2a+3b} = 0$, what is the value of: $\frac{b}{a}$?
a) $\frac{5}{7}$ b) $\frac{7}{5}$ c) $\frac{3}{10}$ d) $\frac{10}{3}$
- 14) If $\frac{a+2b}{a-b} = \frac{2}{3}$, what is the value of: $\frac{b}{a}$?
a) $\frac{1}{8}$ b) 8 c) $-\frac{1}{8}$ d) -8
- 15) If $4x^2 + 9y^2 = 12xy$, what is the value of: $\frac{x}{y}$?
a) $\frac{3}{2}$ b) $\frac{2}{3}$ c) $-\frac{2}{3}$ d) $-\frac{3}{2}$
- 16) If $3a = 6$ $b = 8c$, then $a : b : c$ equals
a) 3 : 4 : 8 b) 3 : 6 : 8 c) 8 : 4 : 3 d) 8 : 6 : 3
- 17) If $\frac{x}{6} = \frac{y}{10}$, what is the value of $\frac{x}{y}$?
a) $\frac{5}{3}$ b) $\frac{5}{6}$ c) $\frac{3}{5}$ d) $\frac{5}{10}$
- 18) If $a, b, 2, 3$ are proportional, what is the value $\frac{b}{a}$?
a) $\frac{3}{2}$ b) $\frac{2}{3}$ c) 3 d) 2
- 19) If $\frac{a}{b} = \frac{2}{7}$, what is the value of $\frac{2b}{7a}$?
a) $\frac{4}{49}$ b) $\frac{2}{7}$ c) 1 d) $\frac{49}{4}$
- 20) If $a, x, b, 2x$ are proportional, what is the value $\frac{a}{b}$?
a) 2 b) $\frac{1}{2}$ c) $\frac{1}{3}$ d) $\frac{1}{4}$



21) If a, b, c, d are proportional quantities, then:

- a) $\frac{b}{d} = \frac{a}{c}$ b) $\frac{a}{c} = \frac{d}{b}$ c) $\frac{b}{c} = \frac{a}{d}$ d) $ab = cd$

22) If $\frac{5}{x} = \frac{6}{y}$, what is the value of $\frac{2x+y}{y-x}$?

- a) 5 b) $\frac{11}{16}$ c) $\frac{16}{11}$ d) 16

23) If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d}$ equals:

- a) $\frac{4}{3}$ b) $\frac{2}{3}$ c) $\frac{4}{9}$ d) $\frac{1}{3}$

24) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$, then each ratio equals:

- a) $\frac{a+b+c}{3}$ b) $\frac{a+2b-c}{3}$ c) $\frac{a-b+c}{10}$ d) $\frac{a-b}{5}$

25) If $\frac{4}{x} = \frac{7}{y} = \frac{a}{y-x}$, what is the value of a ?

- a) -3 b) 3 c) 11 d) 28

26) If $m - n = 6$, $\frac{3}{m} = \frac{5}{n}$, then what is the value of m ?

- a) 15 b) 9 c) -9 d) -15

27) If $\frac{x}{5} = \frac{y}{a} = \frac{3x-2y}{9}$, what is the value of a ?

- a) 6 b) 2 c) 3 d) 9

28) What is the mean proportional between a, c ?

- a) $\sqrt{a+c}$ b) $\frac{a+c}{2}$ c) $\pm\sqrt{ac}$ d) ac

29) Which of the following numbers are proportional?

- a) 2, 4, 6 b) 3, 5, 8 c) 3, 9, 27 d) 1, 4, 9

30) If a is the first proportional for the two numbers 4, 16, what is the value of a ?

- a) 8 b) 4 c) 2 d) 1

31) If b is a mean proportional between 3, 12, what is the value of b ?

- a) ± 4 b) ± 6 c) ± 9 d) ± 36



- 32) If 6 is the mean proportional between the two numbers $m, 2$, what is the value of m ?
- a) 8 b) 12 c) 18 d) 36
- 33) If x is the positive mean proportional between 24 , 54 , what is the value of x ?
- a) 15 b) 36 c) 39 d) 78
- 34) If $2b$ is a mean proportional between a , $5c$, what is the value of: $\frac{b^2}{ac}$?
- a) $\frac{5}{4}$ b) $\frac{2}{5}$ c) $\frac{3}{5}$ d) 10
- 35) If x, y, z are in continued proportion, What is the value of x ?
- a) $\pm\sqrt{yz}$ b) yz c) $\frac{y^2}{z}$ d) $\frac{y}{z}$
- 36) What is the third proportional for the numbers $x^3, 2x^2$?
- a) $2x$ b) $4x$ c) x^2 d) $2x^5$
- 37) If $7, x, \frac{1}{y}$ are in proportion, What is the value of: x^2y ?
- a) 7 b) $\frac{1}{7}$ c) 14 d) 49
- 38) If b is a mean proportional between $(12 - \sqrt{32}), (3 + \sqrt{2})$, what is the value of b ?
- a) $\pm\sqrt{7}$ b) $\pm 2\sqrt{7}$ c) $\pm 4\sqrt{7}$ d) $\pm 16\sqrt{7}$
- 39) If $\frac{a}{b} = \frac{b}{c} = 3$, then which of the following is correct?
- a) $a = 3c$ b) $a = 9b$ c) $a = 9c$ d) $a = 6c$
- 40) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, what is the value of a ?
- a) 5×2^2 b) 40 c) 10 d) 2×5^3
- 41) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, what is the value of $\frac{a}{d}$?
- a) 2 b) 4 c) 8 d) 16

42) The mean proportional between $(x - 2)$, $(x + 2)$ is :

- a) $\sqrt{x + 2}$ b) $x^2 - 4$ c) $\pm\sqrt{x^2 - 4}$ d) $\sqrt{x^2 - 4}$

43) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 3$, then what is the value of : $\frac{a + b + c}{b + c + d}$?

- a) 1 b) 3 c) 9 d) 6

44) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 4$, then what is the value of $\frac{a + d}{d}$?

- a) 65 b) 49 c) 37 d) 25

Q2 Answer the following :-

1) If $y : x = 2 : 5$, find the value of $(10x + 3y) : (5x + 2y)$.

2) If $(2x - 3) : (x - 5) = 1 : 4$ find the value of X.

3) If $4x^2 + 9y^2 = 12xy$, find the value of $\frac{x}{y}$.

4) Find the number if its square is added to both terms of the ratio 7 : 11 it becomes 4 : 5

5) If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$, find the value of z.

6) If a , b , c , d are proportional , prove that $\frac{a+b}{b} = \frac{c+d}{d}$

7) If b is the middle between a , c prove that $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

8) Find the value of x , y if x , 12 , 6 , y in continued proportion

9) If b is the middle between a , c prove that $\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{a}{c}$

10) Find the value of x , y if 2 , x , y , 54 in continued proportion

11) Find the value of x if x , 24 , 144 are proportional

12) If $\frac{a}{4x+y} = \frac{b}{x-4y}$ prove that $\frac{a+b}{5x-3y} = \frac{a-b}{3x+5y}$

13) If $\frac{a}{2x-y} = \frac{b}{2y-x}$ prove that $\frac{2a+b}{a+2b} = \frac{x}{y}$

14) If $\frac{x}{a-b+c} = \frac{y}{b-c+a} = \frac{z}{c-a+b}$ prove that $\frac{x+y}{a} = \frac{y+z}{b}$

15) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a-b+5c}{3x}$ find the value of x.

Unit 2

Q1 Choose the correct answer :-

- 1) If $(x - 1, 11) = (8, y + 3)$, then $\sqrt{x + 2y} =$
- a) 5 b) ± 5 c) $\sqrt{17}$ d) 25
- 2) If $(3^x, \sqrt{y}) = (1, 4)$, then $x + y =$
- a) 2 b) 3 c) 16 d) 17
- 3) If $x > y$, $(x^3, y^2) = (1, 4)$, then $xy =$
- a) 4 b) 2 c) -2 d) -4
- 4) If $(x - 3, y) = (2, \sqrt{16})$, then $(y, x) =$
- a) (1, 4) b) (5, 4) c) (4, 1) d) (4, 5)
- 5) If $X = \{1, 2\}$, then $X \times \emptyset =$
- a) X b) $\emptyset$ c) $\{0\}$ d) $\{(1, 0), (2, 0)\}$
- 6) $\{3\} \times \{5\} =$
- a) $\{15\}$ b) $\{3, 5\}$ c) $(3, 5)$ d) $\{(3, 5)\}$
- 7) If $X = \{3, 5\}$, $Y = \{6, 7\}$, then $(6, 7) \in$
- a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2
- 8) If $X = \{3\}$, then $X^2 =$
- a) 9 b) (3, 3) c) $\{9\}$ d) $\{(3, 3)\}$
- 9) If $X = \{3\}$, then $n(X^2) =$
- a) 1 b) 9 c) $\{3, 3\}$ d) 3
- 10) If $n(X) = 3$, $n(X \times Y) = 12$, then $n(Y) =$
- a) 4 b) 9 c) 15 d) 36
- 11) If $n(X^2) = 9$, then $n(X) =$
- a) 2 b) 3 c) 9 d) 81
- 12) If $X = \{5, 7, 9\}$ and $n(X \times Y) = 6$, then $n(Y^2) =$
- a) 4 b) 6 c) 9 d) 12

13) If $X \times Y = \{(1, 4), (1, 7), (1, 8)\}$, then $n(Y^2) = \dots\dots\dots$

- a) 1 b) 3 c) 6 d) 9

14) If $X = \{2, 3, 4, 7, 8\}$, $Y = \{1, 4, 5, 6\}$, then $n(X^2) - n(Y \times X) = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 25

15) If $n(X^2) = 9$, $n(X \times Y) = 12$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 6 c) 9 d) 16

16) If X is a non-empty set $n(X) = n(X \times Y)$, then $n(Y) = \dots\dots\dots$

- a) 1 b) 2 c) 3 d) 4

17) If X, Y are two sets where: $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- a) 8 b) 9 c) 11 d) 12

18) If X, Y are two sets where: $n(X^2) + n(X \times Y) = 5$, then $n(Y^2) = \dots\dots\dots$

- a) 25 b) 16 c) 4 d) 1

19) To which cartesian product from the following , the point $\left(\frac{1}{2}, \sqrt{5}\right)$ belongs to?

- a) $\mathbb{N} \times \mathbb{N}$ b) $\mathbb{Z} \times \mathbb{Z}$ c) $\mathbb{Q} \times \mathbb{Q}$ d) $\mathbb{R} \times \mathbb{R}$

20) Which of the following ordered pairs belongs to $\mathbb{Q} \times \mathbb{Q}$?

- a) $(\sqrt[3]{1}, \sqrt{2})$ b) $(-\sqrt[3]{16}, -5)$ c) $\left(\sqrt{\frac{4}{9}}, -\frac{1}{2}\right)$ d) $\left(\sqrt[3]{27}, -\sqrt{\frac{1}{8}}\right)$

21) If the function $f: X \rightarrow Y$, then the range of the function f is a subset of

- a) $X \times Y$ b) X c) $Y \times X$ d) Y

22) If $f(x) = x^2 - x + 3$, what is the value of $f(-2)$?

- a) -2 b) -1 c) 5 d) 9

23) If $f(x) = x^2 - \sqrt{2}x$, what is the value of $f(\sqrt{2})$?

- a) 4 b) 2 c) 6 d) 0

- 24)** If the function $f: \mathbb{Z} \rightarrow \mathbb{Z}$ where $f(x) = x^2$, then $f(2) + f(-2) = \dots\dots\dots$
a) 0 b) 4 c) 8 d) -8
- 25)** If $f(x) = x^2$, $g(x) = x + 4$, What is the value of : $5f(2) + 2g(5)$?
a) 18 b) 20 c) 38 d) 70
- 26)** If $f(x) = kx + 8$, $f(2) = 0$, What is the value of k ?
a) 8 b) 6 c) 4 d) -4
- 27)** If $f(x) = x - 5$, and $\frac{1}{2}f(a) = 3$, What is the value of a ?
a) 2 b) 8 c) 11 d) 16
- 28)** If $(-1, 0)$ belongs to the function f where $f(x) = mx + 2$, What is the value of m ?
a) 0 b) -1 c) 2 d) -2
- 29)** If $(3, y)$ belongs to the function f where $f(x) = x + 2$, what is the value of y ?
a) 5 b) 3 c) 2 d) 1
- 30)** If (a, a) belongs to the function f where $f(x) = 2x + 3$, what is the value of a ?
a) 2 b) 3 c) -3 d) -2
- 31)** If $X = \{2, 4, 6\}$, $n(Y) = 4$ and the function $f: X \rightarrow Y$, $f(x) = x^2 - 1$, then Y can be
a) $\{3, 7, 13\}$ b) $\{3, 15, 25, 45\}$ c) $\{3, 15, 35\}$ d) $\{3, 15, 25, 35\}$
- 32)** The straight line representing the function f where $f(x) = 3x - 12$ cuts the x -axis at the point
a) $(-12, 0)$ b) $(12, 0)$ c) $(4, 0)$ d) $(-4, 0)$
- 33)** The straight line representing the function f where $f(x) = 6 - 2x$ cuts the y -axis at the point
a) $(0, -6)$ b) $(0, -3)$ c) $(0, 3)$ d) $(0, 6)$

34) The ordered pair $(1, 2)$ belongs to the function f where:

a) $f(x) = 2x - 1$

b) $f(x) = -3x + 7$

c) $f(x) = 2x + 1$

d) $f(x) = -3x + 5$

35) If $f(x) = 7$, then $f(-3) = \dots\dots\dots$

a) 7

b) -7

c) 21

d) -21

36) If $f(x) = 2$, then $3f(\sqrt{2}) = \dots\dots\dots$

a) $f(3\sqrt{2})$

b) $3\sqrt{2}$

c) 6

d) $2\sqrt{3}$

37) If $f(x) = 2$, then $f(3) - f(1) = \dots\dots\dots$

a) $f(2)$

b) 2

c) 0

d) 4

38) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 3$, then $\frac{f(6)}{f(0)} = \dots\dots\dots$

a) 6

b) 1

c) 3

d) undefined

39) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 7$, what is the value of $\frac{5f(4)}{10f(6)}$?

a) $\frac{1}{3}$

b) $\frac{1}{2}$

c) $\frac{7}{3}$

d) $\frac{7}{2}$

40) The function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 5$ is represented by a straight line that intersects the y-axis at the point $\dots\dots\dots$

a) $(5, 0)$

b) $(0, 5)$

c) $(-5, 0)$

d) $(0, -5)$

41) If the straight line representing the function f where $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

a) -2

b) 2

c) 0

d) 3

- 42)** If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?
- a) -7 b) -1 c) 1 d) 7
- 43)** If the straight line representing the function f where $f(x) = 2x + b$ passes through the point $(-1, 5)$, what is the value of $f(0)$?
- a) -7 b) -5 c) 5 d) 7
- 44)** If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?
- a) 3 b) 4 c) 5 d) 6
- 45)** If $(5k, k)$ belongs to the function f where $f(x) = 3x + 14$, what is the value of k ?
- a) 14 b) 10 c) -7 d) -1
- 46)** If $g(x) = 4$, $f(x) = -3$, what is the perpendicular distance between the two straight lines representing the two functions f, g ?
- a) 1 b) 3 c) 5 d) 7
- 47)** Which of the following equations is an equation of the first degree in one variable?
- a) $x + y = 12$ b) $2x - \frac{2}{x} = 0$ c) $2\sqrt{x} + 3 = 5$ d) $2x - 4 = 3$
- 48)** The solution set of the equation: $5x - 7 = 2x + 5$ in $\mathbb{R}$ is
- a) $\{4\}$ b) $\{3\}$ c) $\{5\}$ d) $\{2\}$
- 49)** What is the solution set of the equation: $\sqrt{2}x - 1 = 1$ in $\mathbb{R}$?
- a) $\{2\}$ b) $\{1\}$ c) $\{\sqrt{2}\}$ d) $\emptyset$

50) The solution set of the equation: $\frac{y+2}{3} = \frac{y-1}{2}$ in $\mathbb{R}$ is

- a) $\{-5\}$ b) $\{7\}$ c) $\{-7\}$ d) $\{5\}$

51) Which of the following inequalities is an inequality of the first degree in one variable?

- a) $x^2 - x \geq 3$ b) $0.4t - 7 < 2t$ c) $\frac{2}{t} + t > 5$ d) $3x < 2y + 5$

52) Which of the following inequalities expresses the solution set in $\mathbb{R}$ represented by the given figure?



- a) $x > 3$ b) $x < 3$ c) $x \geq 3$ d) $x \leq 3$

53) Which of the following inequalities expresses the solution set in $\mathbb{R}$ represented by the given figure?



- a) $-4 < x < 4$ b) $-4 \leq x < 4$ c) $-4 < x \leq 4$ d) $-4 \leq x \leq 4$

54) What is the solution set of the inequality $2x < 14$ in $\mathbb{R}$?

- a) $] -\infty, 7[$ b) $] -7, \infty[$ c) $] 7, \infty[$ d) $[7, \infty[$

55) What is the solution set of the inequality $3 \geq x > -2$ in $\mathbb{R}$?

- a) $] -2, 3]$ b) $[-2, 3[$ c) $[-2, 3]$ d) $] -2, 3[$

56) What is the solution set of the inequality $-x > 3$ in $\mathbb{R}$?

- a) $] -\infty, -3[$ b) $] -\infty, 3[$ c) $] -3, \infty[$ d) $] 3, \infty[$

57) What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

- a) $[-5, 3]$ b) $] -5, 3[$ c) $[-3, 5]$ d) $] -3, 5[$

58) The solution set of the inequality $-1 < x - 5 < 1$ in $\mathbb{R}$ is

- a) $[4, 6]$ b) $] 4, 6[$ c) $] 4, 6]$ d) $[4, 6[$

59) The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality

- a) $-1 < x < 2$ b) $-1 < x < 2$ c) $-1 \leq x < 2$ d) $-1 \leq x \leq 2$

60) If $-2 < 2x < 6$, then $x \in$

- a) $] -1, 3[$ b) $] -1, 3]$ c) $[-1, 3[$ d) $[-1, 3]$

61) If $3 > x > -3$ where $x \in \mathbb{R}$, then $2x$ belongs to

- a) $] -5, 5[$ b) $[-6, 6]$ c) $] -6, 6]$ d) $] -6, 6[$

62) If $2 > x > -2$ where $x \in \mathbb{R}$, then $2x + 3$ belongs to

- a) $[-1, 7]$ b) $] -1, 5[$ c) $] -1, 7[$ d) $] -4, 6[$

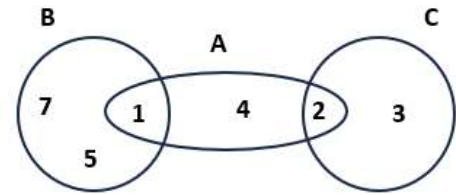
63) The number 5 belongs to the solution set of the inequality

- a) $x > 5$ b) $x < 5$ c) $-x \geq -5$ d) $-x \geq 5$

Q2 Answer the following :-**1) Using the opposite venn diagram find :**

a) $(A \cap C) \times B$

b) $(C \cup B) \times B$

**2) If $A = \{1, 7, 9\}$, $B = \{2, 4, 7\}$, $C = \{1, 7\}$, find :****a) $A \times C$ and represent it by arrow diagram**

b) $B \times (A \cup C)$

3) If $X = \{1, 3, 5\}$, $Y = \{1, 2, 4, 5, 6\}$ and $\mathbb{R}$ is a relation from X to Y , where $a\mathbb{R}b$ means $a+b=7$, for each $a \in X$, $b \in Y$ **a) Write the relation $\mathbb{R}$ as a set of ordered pairs****b) Write the relation $\mathbb{R}$ in a table****c) Represent the relation by an arrow diagram****d) Represent the relation by a cartesian diagram****e) Find its domain and range****4) If $f(X) = 3X + b$, $f(4) = 15$, find the value of $5b^2 + 2b - 20$**

5) If $X = \{4, 3, 2\}$, and $\mathbb{R}$ is a relation from X to X , which $a\mathbb{R}b$ means $b+a=\text{even number}$, $a \in X$, $b \in Y$

- a) Write the relation $\mathbb{R}$ as a set of ordered pairs
- b) Write the relation $\mathbb{R}$ in a table
- c) Represent the relation by an arrow diagram
- d) Represent the relation by a cartesian diagram
- e) Is the relation is a function ? why ?

6) Represent the following graphically :

1) $f(X) = 2X - 1$

2) $f(X) = 3X$

3) $f(X) = 5$

7) If $f(x) = 2x + k$, the point (3 , 11) lies on the straight line which represent the function f , find the value of $f(2)$, k

8) If $f(x) = 2x + b$, the point (3 , 10) lies on the straight line which represent the function f , find the value of $f(5)$, b

9) Find the solution set in $\mathbb{R}$ of the equation $2x - \sqrt{2} = 5\sqrt{2}$

10) Find the solution set in $\mathbb{R}$ of the equation $4(x + 5) + 3 = 2x + 11$

11) Find the solution set in $\mathbb{R}$ of the equation $6x - 5 = 2x + 11$

12) Use the inequality to express the set of real numbers greater than 5 and less than 8 then represent on the number line

13) Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line $5 - 3x \geq 2$

14) If $f(X) = 5X + b$, $f(2) = 12$, find the value of $b^2 - 2b - 1$

Answers

Unit 1

Q1 Choose the correct answer :-

1) If $x, 3, 4, 6$ are proportional, what is the value of x ?

- a) 0 b) 1 c) 2 d) 3

2) What is the second proportional for the numbers 4, 6, 12 ?

- a) 18 b) 8 c) 6 d) 2

3) If $7x = 3y$, what is the value of $\frac{y}{x}$?

- a) $\frac{3}{7}$ b) $\frac{3}{10}$ c) $\frac{10}{3}$ d) $\frac{3}{7}$

4) If $2x = 7y$, what is the value of $\left(\frac{x}{y}\right)^{-1}$?

- a) $\frac{7}{2}$ b) $\frac{7}{2}$ c) $\frac{49}{4}$ d) $\frac{4}{49}$

5) If $5x - 3y = 0$, what is the value of $\frac{x}{y}$?

- a) $\frac{5}{3}$ b) $\frac{3}{5}$ c) $-\frac{3}{5}$ d) $-\frac{5}{3}$

6) If $5a, 2, 3b, 7$ are four proportional quantities. What is the value of: $\frac{a}{b}$?

- a) $\frac{3}{7}$ b) $\frac{6}{35}$ c) $\frac{3}{5}$ d) $\frac{3}{2}$

7) If $\frac{a}{5} = \frac{b}{3}$, what is the value of: $\frac{a+b}{a-b}$?

- a) $\frac{8}{3}$ b) $\frac{5}{3}$ c) $\frac{1}{4}$ d) 4

8) If $\frac{a}{3} = \frac{b}{4}$, what is the value of: $\frac{3a-b}{b-a}$?

- a) $\frac{4}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{5}$ d) 5

9) If $\frac{a}{3} = \frac{b}{2}$, what is the value of $(6a - 9b - 1)^{2026}$?

- a) 2026 b) -2026 c) 1 d) -1

10) If $\frac{a}{3} = \frac{b}{5}$, $5a - 2b = 20$, what is the value of: b ?

- a) 3 b) 5 c) 15 d) 20

11) If $\frac{3a}{5b} = \frac{1}{2}$, what is the value of: $\frac{a}{b}$?

a) $\frac{6}{5}$

b) $\frac{5}{6}$

c) $\frac{2}{3}$

d) $\frac{3}{2}$

12) If $4x^2 = 9y^2$, what is the value of: $\frac{x}{y}$?

a) $\frac{9}{4}$

b) $\frac{3}{2}$

c) $\pm \frac{2}{3}$

d) $\pm \frac{3}{2}$

13) If $\frac{5a-7b}{2a+3b} = 0$, what is the value of: $\frac{b}{a}$?

a) $\frac{5}{7}$

b) $\frac{7}{5}$

c) $\frac{3}{10}$

d) $\frac{10}{3}$

14) If $\frac{a+2b}{a-b} = \frac{2}{3}$, what is the value of: $\frac{b}{a}$?

a) $\frac{1}{8}$

b) 8

c) $-\frac{1}{8}$

d) -8

15) If $4x^2 + 9y^2 = 12xy$, what is the value of: $\frac{x}{y}$?

a) $\frac{2}{3}$

b) $\frac{3}{2}$

c) $-\frac{2}{3}$

d) $-\frac{3}{2}$

16) If $3a = 6$ $b = 8c$, then $a : b : c$ equals

a) 3 : 4 : 8

b) 3 : 6 : 8

c) 8 : 4 : 3

d) 8 : 6 : 3

17) If $\frac{x}{6} = \frac{y}{10}$, what is the value of $\frac{x}{y}$?

a) $\frac{5}{3}$

b) $\frac{5}{6}$

c) $\frac{3}{5}$

d) $\frac{5}{10}$

18) If $a, b, 2, 3$ are proportional, what is the value $\frac{b}{a}$?

a) $\frac{3}{2}$

b) $\frac{2}{3}$

c) 3

d) 2

19) If $\frac{a}{b} = \frac{2}{7}$, what is the value of $\frac{2b}{7a}$?

a) $\frac{4}{49}$

b) $\frac{2}{7}$

c) 1

d) $\frac{49}{4}$

20) If $a, x, b, 2x$ are proportional, what is the value $\frac{a}{b}$?

a) 2

b) $\frac{1}{2}$

c) $\frac{1}{3}$

d) $\frac{1}{4}$

21) If a, b, c, d are proportional quantities, then:

a) $\frac{b}{d} = \frac{a}{c}$ b) $\frac{a}{c} = \frac{d}{b}$ c) $\frac{b}{c} = \frac{a}{d}$ d) $ab = cd$

22) If $\frac{5}{x} = \frac{6}{y}$, what is the value of $\frac{2x+y}{y-x}$?

a) 5 b) $\frac{11}{16}$ c) $\frac{16}{11}$ d) 16

23) If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d}$ equals

a) $\frac{4}{3}$ b) $\frac{2}{3}$ c) $\frac{4}{9}$ d) $\frac{1}{3}$

24) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$, then each ratio equals:

a) $\frac{a+b+c}{3}$ b) $\frac{a+2b-c}{3}$ c) $\frac{a-b+c}{10}$ d) $\frac{a-b}{5}$

25) If $\frac{4}{x} = \frac{7}{y} = \frac{a}{y-x}$, what is the value of a ?

a) -3 b) 3 c) 11 d) 28

26) If $m - n = 6$, $\frac{3}{m} = \frac{5}{n}$, then what is the value of m ?

a) 15 b) 9 c) -9 d) -15

27) If $\frac{x}{5} = \frac{y}{a} = \frac{3x-2y}{9}$, what is the value of a ?

a) 6 b) 2 c) 3 d) 9

28) What is the mean proportional between a, c ?

a) $\sqrt{a+c}$ b) $\frac{a+c}{2}$ c) $\pm\sqrt{ac}$ d) ac

29) Which of the following numbers are proportional?

a) 2, 4, 6 b) 3, 5, 8 c) 3, 9, 27 d) 1, 4, 9

30) If a is the first proportional for the two numbers 4, 16, what is the value of a ?

a) 8 b) 4 c) 2 d) 1

31) If b is a mean proportional between 3, 12, what is the value of b ?

a) ± 4 b) ± 6 c) ± 9 d) ± 36

- 32) If 6 is the mean proportional between the two numbers $m, 2$, what is the value of m ?
- a) 8 b) 12 c) 18 d) 36
- 33) If x is the positive mean proportional between 24 , 54 , what is the value of x ?
- a) 15 b) 36 c) 39 d) 78
- 34) If $2b$ is a mean proportional between a , $5c$, what is the value of: $\frac{b^2}{ac}$?
- a) 1 b) $\frac{2}{5}$ c) $\frac{3}{5}$ d) 10
- 35) If x, y, z are in continued proportion, What is the value of x ?
- a) $\pm\sqrt{yz}$ b) yz c) $\frac{y^2}{z}$ d) $\frac{y}{z}$
- 36) What is the third proportional for the numbers $x^3, 2x^2$?
- a) $2x$ b) $4x$ c) x^2 d) $2x^5$
- 37) If $7, x, \frac{1}{y}$ are in proportion, What is the value of: x^2y ?
- a) 7 b) $\frac{1}{7}$ c) 14 d) 49
- 38) If b is a mean proportional between $(12 - \sqrt{32}), (3 + \sqrt{2})$, what is the value of b ?
- a) $\pm\sqrt{7}$ b) $\pm 2\sqrt{7}$ c) $\pm 4\sqrt{7}$ d) $\pm 16\sqrt{7}$
- 39) If $\frac{a}{b} = \frac{b}{c} = 3$, then which of the following is correct?
- a) $a = 3c$ b) $a = 9b$ c) $a = 9c$ d) $a = 6c$
- 40) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, what is the value of a ?
- a) 5×2^2 b) 40 c) 10 d) 2×5^3
- 41) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, what is the value of $\frac{a}{d}$?
- a) 2 b) 4 c) 8 d) 16

42) The mean proportional between $(x - 2)$, $(x + 2)$ is :

a) $\sqrt{x+2}$

b) $x^2 - 4$

c) $+\sqrt{x^2 - 4}$

d) $\sqrt{x^2 - 4}$

43) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 3$, then what is the value of : $\frac{a+b+c}{b+c+d}$?

a) 1

b) 3

c) 9

d) 6

44) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 4$, then what is the value of $\frac{a+d}{d}$?

a) 65

b) 49

c) 37

d) 25

Q2 Answer the following :-

1) If $y : x = 2 : 5$, find the value of $(10x + 3y) : (5x + 2y)$.

$$\frac{56}{29}$$

For more steps
watch 

2) If $(2x-3) : (x-5) = 1 : 4$ find the value of X.

$$= 1$$

3) If $4x^2 + 9y^2 = 12xy$, find the value of $\frac{x}{y}$.

$$\frac{3}{2}$$

4) Find the number if its square is added to both terms of the ratio 7 : 11 it becomes 4 : 5

$$3 \text{ or } -3$$

5) If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$, find the value of z.

$$-15$$



6) If a, b, c, d are proportional, prove that $\frac{a+b}{b} = \frac{c+d}{d}$

$$\frac{a}{b} = \frac{c}{d} = k, \quad a = bk \quad c = dk$$

$$\frac{a+b}{b} = \frac{bk+b}{b} = \frac{b(k+1)}{b} = k+1 \quad 1$$

$$\frac{c+d}{d} = \frac{dk+d}{d} = \frac{d(k+1)}{d} = k+1 \quad 2$$

from 1 and 2 $\frac{a+b}{b} = \frac{c+d}{d}$

7) If b is the middle between a, c prove that $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

$$a = ck^2, \quad b = ck$$

$$\frac{a-c}{a+b} = \frac{ck^2-c}{ck^2+ck} = \frac{c(k^2-1)}{ck(k+1)} = \frac{c(k-1)(k+1)}{ck(k+1)} = \frac{(k-1)}{k} \quad 1$$

$$\frac{a-2b+c}{a-b} = \frac{ck^2-2ck+c}{ck^2-ck} = \frac{c(k^2-2k+1)}{ck(k-1)} = \frac{c(k-1)(k-1)}{ck(k-1)} = \frac{(k-1)}{k} \quad 2$$

from 1 and 2 $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

8) Find the value of x, y if $x, 12, 6, y$ in continued proportion

$$x = 24 \quad y = 3$$

9) If b is the middle between a, c prove that $\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{a}{c}$

$$a = ck^2, \quad b = ck$$

$$\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{4c^2k^4-9c^2k^2}{4c^2k^2-9c^2} = \frac{c^2k^2(4k^2-9)}{c^2(4k^2-9)} = k^2 \quad 1$$

$$\frac{a}{c} = \frac{ck^2}{c} = k^2 \quad 2$$

from 1 and 2 $\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{a}{c}$



10) Find the value of x , y if 2 , x , y , 54 in continued proportion

$$X = 6 \quad y = 18$$

11) Find the value of x if x , 24 , 144 are proportional

$$X = 4$$

12) If $\frac{a}{4x+y} = \frac{b}{x-4y}$ prove that $\frac{a+b}{5x-3y} = \frac{a-b}{3x+5y}$

Prove by yourself or watch the video on YouTube

13) If $\frac{a}{2x-y} = \frac{b}{2y-x}$ prove that $\frac{2a+b}{a+2b} = \frac{x}{y}$

Prove by yourself or watch the video on YouTube

14) If $\frac{x}{a-b+c} = \frac{y}{b-c+a} = \frac{z}{c-a+b}$ prove that $\frac{x+y}{a} = \frac{y+z}{b}$

Prove by yourself or watch the video on YouTube

15) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a-b+5c}{3x}$ find the value of x .

$$x = 7$$



Unit 2

Q1 Choose the correct answer :-

1) If $(x - 1, 11) = (8, y + 3)$, then $\sqrt{x + 2y} = \dots\dots\dots$

a) 5

b) ± 5 c) $\sqrt{17}$

d) 25

2) If $(3^x, \sqrt{y}) = (1, 4)$, then $x + y = \dots\dots\dots$

a) 2

b) 3

c) 16

d) 17

3) If $x > y$, $(x^3, y^2) = (1, 4)$, then $xy = \dots\dots\dots$

a) 4

b) 2

c) -2

d) -4

4) If $(x - 3, y) = (2, \sqrt{16})$, then $(y, x) = \dots\dots\dots$

a) (1, 4)

b) (5, 4)

c) (4, 1)

d) (4, 5)

5) If $X = \{1, 2\}$, then $X \times \emptyset = \dots\dots\dots$

a) X

b) $\emptyset$ c) $\{0\}$ d) $\{(1, 0), (2, 0)\}$

6) $\{3\} \times \{5\} = \dots\dots\dots$

a) {15}

b) {3, 5}

c) (3, 5)

d) {(3, 5)}

7) If $X = \{3, 5\}$, $Y = \{6, 7\}$, then $(6, 7) \in \dots\dots\dots$

a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2

8) If $X = \{3\}$, then $X^2 = \dots\dots\dots$

a) 9

b) (3, 3)

c) {9}

d) {(3, 3)}

9) If $X = \{3\}$, then $n(X^2) = \dots\dots\dots$

a) 1

b) 9

c) {3, 3}

d) 3

10) If $n(X) = 3$, $n(X \times Y) = 12$, then $n(Y) = \dots\dots\dots$

a) 4

b) 9

c) 15

d) 36

11) If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

a) 2

b) 3

c) 9

d) 81

12) If $X = \{5, 7, 9\}$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 6 c) 9 d) 12

13) If $X \times Y = \{(1, 4), (1, 7), (1, 8)\}$, then $n(Y^2) = \dots\dots\dots$

- a) 1 b) 3 c) 6 d) 9

14) If $X = \{2, 3, 4, 7, 8\}$, $Y = \{1, 4, 5, 6\}$, then $n(X^2) - n(Y \times X) = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 25

15) If $n(X^2) = 9$, $n(X \times Y) = 12$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 6 c) 9 d) 16

16) If X is a non-empty set $n(X) = n(X \times Y)$, then $n(Y) = \dots\dots\dots$

- a) 1 b) 2 c) 3 d) 4

17) If X, Y are two sets where: $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- a) 8 b) 9 c) 11 d) 12

18) If X, Y are two sets where: $n(X^2) + n(X \times Y) = 5$, then $n(Y^2) = \dots\dots\dots$

- a) 25 b) 16 c) 4 d) 1

19) To which cartesian product from the following, the point $\left(\frac{1}{2}, \sqrt{5}\right)$ belongs to?

- a) $\mathbb{N} \times \mathbb{N}$ b) $\mathbb{Z} \times \mathbb{Z}$ c) $\mathbb{Q} \times \mathbb{Q}$ d) $\mathbb{R} \times \mathbb{R}$

20) Which of the following ordered pairs belongs to $\mathbb{Q} \times \mathbb{Q}$?

- a) $(\sqrt[3]{1}, \sqrt{2})$ b) $(-\sqrt[3]{16}, -5)$ c) $\left(\sqrt{\frac{4}{9}}, -\frac{1}{2}\right)$ d) $\left(\sqrt[3]{27}, -\sqrt{\frac{1}{8}}\right)$

21) If the function $f: X \rightarrow Y$, then the range of the function f is a subset of

- a) $X \times Y$ b) X c) $Y \times X$ d) Y

22) If $f(x) = x^2 - x + 3$, what is the value of $f(-2)$?

- a) -2 b) -1 c) 5 d) 9

23) If $f(x) = x^2 - \sqrt{2}x$, what is the value of $f(\sqrt{2})$?

a) 4

b) 2

c) 6

d) 0

24) If the function $f: \mathbb{Z} \rightarrow \mathbb{Z}$ where $f(x) = x^2$, then $f(2) + f(-2) = \dots\dots\dots$

a) 0

b) 4

c) 8

d) -8

25) If $f(x) = x^2$, $g(x) = x + 4$, What is the value of : $5f(2) + 2g(5)$?

a) 18

b) 20

c) 38

d) 70

26) If $f(x) = kx + 8$, $f(2) = 0$, What is the value of k ?

a) 8

b) 6

c) 4

d) -4

27) If $f(x) = x - 5$, and $\frac{1}{2}f(a) = 3$, What is the value of a ?

a) 2

b) 8

c) 11

d) 16

28) If $(-1, 0)$ belongs to the function f where $f(x) = mx + 2$, What is the value of m ?

a) 0

b) -1

c) 2

d) -2

29) If $(3, y)$ belongs to the function f where $f(x) = x + 2$, what is the value of y ?

a) 5

b) 3

c) 2

d) 1

30) If (a, a) belongs to the function f where $f(x) = 2x + 3$, what is the value of a ?

a) 2

b) 3

c) -3

d) -2

31) If $X = \{2, 4, 6\}$, $n(Y) = 4$ and the function $f: X \rightarrow Y$, $f(x) = x^2 - 1$, then Y can be

a) $\{3, 7, 13\}$ b) $\{3, 15, 25, 45\}$ c) $\{3, 15, 35\}$ d) $\{3, 15, 25, 35\}$

32) The straight line representing the function f where $f(x) = 3x - 12$ cuts the x -axis at the point

a) $(-12, 0)$ b) $(12, 0)$ c) $(4, 0)$ d) $(-4, 0)$

33) The straight line representing the function f where $f(x) = 6 - 2x$ cuts the y -axis at the point

- a) $(0, -6)$ b) $(0, -3)$ c) $(0, 3)$ d) $(0, 6)$

34) The ordered pair $(1, 2)$ belongs to the function f where:

- a) $f(x) = 2x - 1$ b) $f(x) = -3x + 7$
 c) $f(x) = 2x + 1$ d) $f(x) = -3x + 5$

35) If $f(x) = 7$, then $f(-3) = \dots\dots\dots$

- a) 7 b) -7 c) 21 d) -21

36) If $f(x) = 2$, then $3f(\sqrt{2}) = \dots\dots\dots$

- a) $f(3\sqrt{2})$ b) $3\sqrt{2}$ c) 6 d) $2\sqrt{3}$

37) If $f(x) = 2$, then $f(3) - f(1) = \dots\dots\dots$

- a) $f(2)$ b) 2 c) 0 d) 4

38) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 3$, then $\frac{f(6)}{f(0)} = \dots\dots\dots$

- a) 6 b) 1 c) 3 d) undefined

39) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 7$, what is the value of $\frac{5f(4)}{10f(6)}$?

- a) $\frac{1}{3}$ b) $\frac{1}{2}$ c) $\frac{7}{3}$ d) $\frac{7}{2}$

40) The function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 5$ is represented by a straight line that intersects the y-axis at the point

- a) $(5, 0)$ b) $(0, 5)$ c) $(-5, 0)$ d) $(0, -5)$

41) If the straight line representing the function f where $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

- a) -2 b) 2 c) 0 d) 3

42) If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?

- a) -7 b) -1 c) 1 d) 7

43) If the straight line representing the function f where $f(x) = 2x + b$ passes through the point $(-1, 5)$, what is the value of $f(0)$?

- a) -7 b) -5 c) 5 d) 7

44) If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?

- a) 3 b) 4 c) 5 d) 6

45) If $(5k, k)$ belongs to the function f where $f(x) = 3x + 14$, what is the value of k ?

- a) 14 b) 10 c) -7 d) -1

46) If $g(x) = 4$, $f(x) = -3$, what is the perpendicular distance between the two straight lines representing the two functions f, g ?

- a) 1 b) 3 c) 5 d) 7

47) Which of the following equations is an equation of the first degree in one variable?

- a) $x + y = 12$ b) $2x - \frac{2}{x} = 0$ c) $2\sqrt{x} + 3 = 5$ d) $2x - 4 = 3$

48) The solution set of the equation: $5x - 7 = 2x + 5$ in $\mathbb{R}$ is

- a) $\{4\}$ b) $\{3\}$ c) $\{5\}$ d) $\{2\}$

49) What is the solution set of the equation: $\sqrt{2}x - 1 = 1$ in $\mathbb{R}$?

- a) $\{2\}$ b) $\{1\}$ c) $\{\sqrt{2}\}$ d) $\emptyset$

50) The solution set of the equation: $\frac{y+2}{3} = \frac{y-1}{2}$ in $\mathbb{R}$ is

- a) $\{-5\}$ b) $\{7\}$ c) $\{-7\}$ d) $\{5\}$

51) Which of the following inequalities is an inequality of the first degree in one variable?

- a) $x^2 - x \geq 3$ b) $0.4t - 7 < 2t$ c) $\frac{2}{t} + t > 5$ d) $3x < 2y + 5$

52) Which of the following inequalities expresses the solution set in $\mathbb{R}$ represented by the given figure?



- a) $x > 3$ b) $x < 3$ c) $x \geq 3$ d) $x \leq 3$

53) Which of the following inequalities expressed by the given figure?



- a) $-4 < x < 4$ b) $-4 \leq x < 4$ c) $-4 < x \leq 4$ d) $-4 \leq x \leq 4$

54) What is the solution set of the inequality $2x < 14$ in $\mathbb{R}$?

- a) $] -\infty, 7[$ b) $] -7, \infty[$ c) $] 7, \infty[$ d) $[7, \infty[$

55) What is the solution set of the inequality $3 \geq x > -2$ in $\mathbb{R}$?

- a) $[-2, 3]$ b) $[-2, 3[$ c) $[-2, 3]$ d) $] -2, 3[$

56) What is the solution set of the inequality $-x > 3$ in $\mathbb{R}$?

- a) $] -\infty, -3[$ b) $] -\infty, 3[$ c) $] -3, \infty[$ d) $] 3, \infty[$

57) What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

- a) $[-5, 3]$ b) $] -5, 3[$ c) $[-3, 5]$ d) $] -3, 5[$

58) The solution set of the inequality $-1 < x - 5 < 1$ in $\mathbb{R}$ is

- a) $[4, 6]$ b) $] 4, 6[$ c) $] 4, 6]$ d) $[4, 6[$

59) The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality

- a) $-1 < x < 2$ b) $-1 < x < 2$ c) $-1 \leq x < 2$ d) $-1 \leq x \leq 2$

60) If $-2 < 2x < 6$, then $x \in$

- a) $] -1, 3[$ b) $] -1, 3]$ c) $[-1, 3[$ d) $[-1, 3]$

61) If $3 > x > -3$ where $x \in \mathbb{R}$, then $2x$ belongs to

- a) $] -5, 5[$ b) $[-6, 6]$ c) $] -6, 6[$ d) $] -6, 6[$

62) If $2 > x > -2$ where $x \in \mathbb{R}$, then $2x + 3$ belongs to

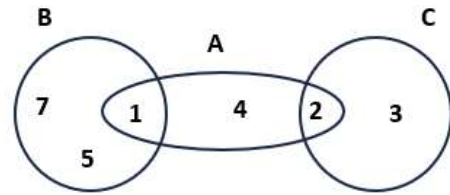
- a) $[-1, 7]$ b) $] -1, 5[$ c) $] -1, 7[$ d) $] -4, 6[$

63) The number 5 belongs to the solution set of the inequality

- a) $x > 5$ b) $x < 5$ c) $-x \geq -5$ d) $-x \geq 5$

Q2 Answer the following :-

1) Using the opposite venn diagram find :



a) $(A \cap C) \times B$

$\{(2, 1), (2, 5), (2, 7)\}$

b) $(C \cup B) \times B$

$\{(1, 1), (1, 5), (1, 7), (2, 1), (2, 5), (2, 7), (3, 1), (3, 5), (3, 7), (5, 1), (5, 5), (5, 7), (7, 1), (7, 5), (7, 7)\}$



2) If $A = \{1, 7, 9\}$, $B = \{2, 4, 7\}$, $C = \{1, 7\}$, find :

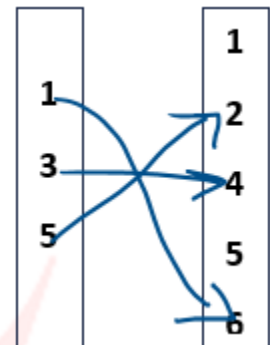
a) $A \times C$ and represent it by arrow diagram

$\{(1, 1), (1, 7), (7, 1), (7, 7), (9, 1), (9, 7)\}$

b) $B \times (A \cup C)$

$\{(4, 1), (4, 7), (4, 9), (2, 1), (2, 7), (2, 9), (7, 1), (7, 7), (7, 9)\}$

3) If $X = \{1, 3, 5\}$, $Y = \{1, 2, 4, 5, 6\}$ and $\mathbb{R}$ is a relation from X to Y , where $a\mathbb{R}b$ means $a+b=7$, for each $a \in X$, $b \in Y$



a) Write the relation $\mathbb{R}$ as a set of ordered pairs

$\mathbb{R} = \{(1, 6), (3, 4), (5, 2)\}$

b) Write the relation $\mathbb{R}$ in a table

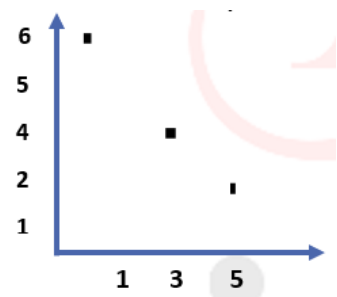
X	1	3	5
Y	6	4	2

c) Represent the relation by an arrow diagram

d) Represent the relation by a cartesian diagram

e) Find its domain and range

domain = $\{1, 3, 5\}$ range = $\{2, 4, 6\}$



4) If $f(X) = 3X + b$, $f(4) = 15$, find the value of $5b^2 + 2b - 20$

= 31

5) If $X = \{4, 3, 2\}$, and $\mathbb{R}$ is a relation from X to X , which $a\mathbb{R}b$ means $b+a=\text{even number}$, $a \in X$, $b \in Y$

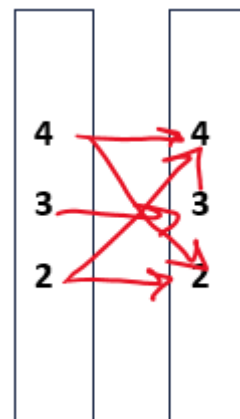
a) Write the relation $\mathbb{R}$ as a set of ordered pairs

$$\mathbb{R} = \{(4, 4), (4, 2), (2, 2), (2, 4), (3, 3)\}$$

b) Write the relation $\mathbb{R}$ in a table

X	2	2	3	4	4
Y	2	4	3	2	4

c) Represent the relation by an arrow diagram

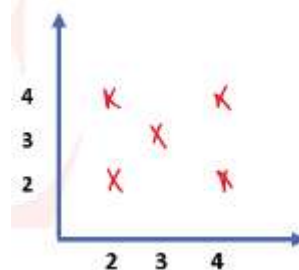


d) Represent the relation by a cartesian diagram

e) Is the relation is a function ? why ?

No, because the elements 4 and 2 $\in X$ appear as

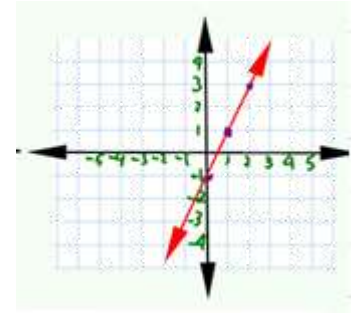
A first projection more than one time



6) Represent the following graphically :

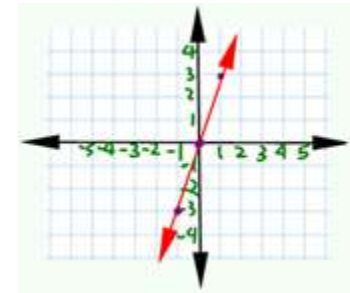
1) $f(X) = 2X - 1$

x	0	1	2
$f(x)$	-1	1	3



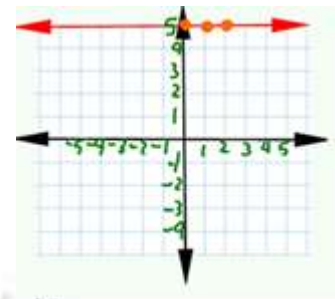
2) $f(X) = 3X$

x	0	1	-1
$f(x)$	0	3	-3



3) $f(X) = 5$

x	0	1	2
$f(x)$	5	5	5



7) If $f(x) = 2x + k$, the point (3, 11) lies on the straight line which represent the function f , find the value of $f(2)$, k

$k=5$ $f(2)=9$

8) If $f(x) = 2x + b$, the point (3, 10) lies on the straight line which represent the function f , find the value of $f(5)$, b

$b = 4$ $f(5) = 14$

9) Find the solution set in $\mathbb{R}$ of the equation $2x - \sqrt{2} = 5\sqrt{2}$

$S.S = \{3\sqrt{2}\}$

10) Find the solution set in $\mathbb{R}$ of the equation $4(x + 5) + 3 = 2x + 11$

$S.S = \{-6\}$

11) Find the solution set in $\mathbb{R}$ of the equation $6x - 5 = 2x + 11$

$S.S = \{4\}$

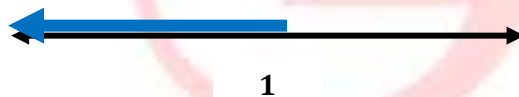
12) Use the inequality to express the set of real numbers greater than 5 and less than 8 then represent on the number line

$5 < x < 8$



13) Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line $5 - 3x \geq 2$

$S.S =]-\infty, 1]$



14) If $f(X) = 5X + b$, $f(2) = 12$, find the value of $b^2 - 2b - 10$

$= -10$

End of 1st monthQ1 Choose the correct answer:

1. What is the fourth proportional for the quantities 2, 4, 5?

- a) 12 b) 10 c) 3 d) 6

2. What is the S.S. for the equation: $\sqrt{5}x - 1 = 4$ in $\mathbb{R}$?

- a) {5} b) {4} c) $\emptyset$ d) $\{\sqrt{5}\}$

3. If a is the first proportional for the two numbers 8 , 16 what is the value of a?

- a) 1 b) 2 c) 4 d) 8

4. The ordered pair (1, 3) belongs to the function f where:

- a) $f(x) = 3x + 1$ b) $f(x) = -2x + 7$
c) $f(x) = 3x - 1$ d) $f(x) = -3x + 6$

5. If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d} = \dots\dots$

- a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{3}{5}$ d) $\frac{5}{3}$

6. The first proportional for the quantities 2, 3, 6 is

- a) 1 b) 2 c) 8 d) 9

7. If $(a + 3, b - 2) = (5, 5)$, what is the value of $a + b$?

- a) 5 b) 8 c) 9 d) 10

8. If $\frac{a}{4} = \frac{b}{3}$, then what is the value of $\frac{a+c}{a-c}$?

- a) $\frac{7}{3}$ b) $\frac{4}{3}$ c) $\frac{1}{7}$ d) 7

9. If $X = \{2\}, Y = \{3\}$, then $X \times Y = \dots\dots\dots$

- a) 6 b) {6} c) (2,3) d) {(2,3)}



10. What is the third proportional x^4 , $3x^3$?

- a) $2x^2$ b) $2x$ c) $4x^2$ d) $4x^3$

11. If : $n(X^2) = 9$, $n(X \times Y) = 12$, then $n(Y^2) = \dots\dots\dots$

- a) 6 b) 9 c) 16 d) 10

12. If : $X \times Y = \{(4, 5), (4, 7), (9, 7), (9, 5)\}$, then $X = \dots\dots\dots$

- a) $\{5, 9\}$ b) $\{4, 9\}$ c) $\{7, 5\}$ d) $\{7, 9\}$

13. If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y , where $R = \{(5, 9), (8, 9), (K, 9)\}$, what is the value of K ?

- a) 5 b) 7 c) 8 d) 9

14. What is the solution set of inequality $5x \leq 25$ in R

- a) $] -\infty, 5[$ b) $] 5, \infty[$ c) $[5, \infty[$ d) $] -\infty, 5]$

15. Which of the following cartesian product $(\frac{1}{5}, \sqrt{5})$ belong to ?

- a) $\mathbb{N} \times \mathbb{N}$ b) $\mathbb{Z} \times \mathbb{Z}$ c) $\mathbb{Q} \times \mathbb{Q}$ d) $\mathbb{R} \times \mathbb{R}$

16. If R to R and $f(x) = 5$, what is the value of $f(10) - f(7)$?

- a) 0 b) 3 c) 5 d) 17

17. If $5x - 2y = 0$, what is the value of $\frac{x}{y}$?

- a) $\frac{-5}{2}$ b) $\frac{-2}{5}$ c) $\frac{2}{5}$ d) $\frac{5}{2}$

18. If $3a = 5b = 4c$, then $a : b : c = \dots\dots\dots$

- a) 9:12:16 b) 20:12:15
c) 15:10:9 d) 8:5:3



19. What is the solution set of inequality $3 \geq x > -3$ in R ?

- a) $] -3, 3[$ b) $] -3, 3]$ c) $[-3, 3[$ d) $[-3, 3]$

20. If $X = \{5, 3\}$, $Y = \{4, 8\}$, then $(4, 3) \in$

- a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2

Q2 Answer the following:

1. Find the value of x that makes the following numbers are proportional: x , 20, 30, 60.

2. Find the value of x and y to make the quantities x , 6, 12, y are in continued proportion.

3. If $x : y = 3 : 4$, find the value of: $(6x + 4y) : (3x + 2y)$.

4. If $X = \{1, 5, 6\}$, $Y = \{5, 7\}$, $Z = \{2, 3, 5\}$, find:

- a) $(X \times Z)$
b) $(X \cup Y) \times (X \cap Y)$
c) $n(X^2)$
d) $(X - Y) \times (Y - Z)$



5. Find the solution set in $\mathbb{R}$ for the equation: $6x + 3 = 2x + 11$.

6. If $X = \{0, 1, 2, 3\}$, $Y = \{1, 2, 4, 5, 6\}$ and R is a relation from X to Y where xRy means: $x+y = 6$ for each $x \in X$, $y \in Y$.

a) Represent R as a set of ordered pairs.

b) Write the relation in a table.

c) Represent the using the arrow diagram.

d) Represent the using the cartesian product.

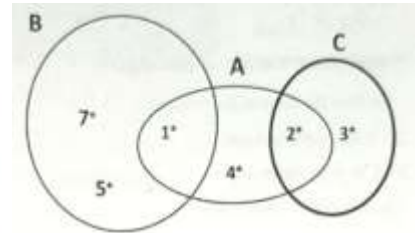
e) State the domain and the range of the relation.

7. Find the number if added to the numbers 3,5,8,12 they will be proportional.

8. If b is the proportional mean between a and c , prove that $\frac{4a^2 - 9b^2}{4b^2 - 9c^2} = \frac{a}{c}$

9. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a+mb+5c}{25}$, find the value of m .

10. Using the opposite Venn diagram:



a) $(A \cap C) \times B$

b) $(C \cup B) \times A$

c) $n(A \times B)$

11. If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$, find the value of z .

12. If the quantities a, b, c, d are proportional, prove that: $\frac{4b + 7d}{4a + 7c} = \frac{5b - 8d}{5a - 8c}$

13. If $X = \{1, 3, 4\}$ and R is a relation on X where xRy means $(x + y)$ is an odd number for each $x \in X, y \in X$.

a) Represent R as a set of ordered pairs.

b) Represent the relation using the arrow diagram.

c) Represent the relation using a graphically.

d) State the domain and the range of the relation.

14. Find the value of x if the numbers $x, 24, 144$ are proportional.

15. If $(x - 4, 9) = (5, x + y)$, find the value of: $\sqrt{4x + 2y}$.

16. If $a, 3, 9, b$ are in continued proportion, find the value of a and b .

17. Find the S.S. in $\mathbb{R}$ for the following inequality and represent it on the number line: $2 \leq 3x - 1 \leq 14$

18. Represent graphically the function: $f(x) = 2x - 5$.

19. The following table is the set of ordered pairs for the function f where $f(x) = 3x + 4$ find the value of $a + b$

x	2	a	7
$f(x)$	10	16	b

20. If $f(x) = 2x - b$, $f(3) = 10$, Find the value of $3b^2 - 5b + 7$.

21. If $X = \{1, 3, 5\}$ and R is a function on X where: $R = \{(a, 3), (b, 1), (1, 5)\}$. Find $(a + b)$.

22. If $X = \{1, 2, 3, 4, 5\}$, N is the set of natural numbers and f is a function from X to N where:

$$f(x) = x^2 - 1.$$

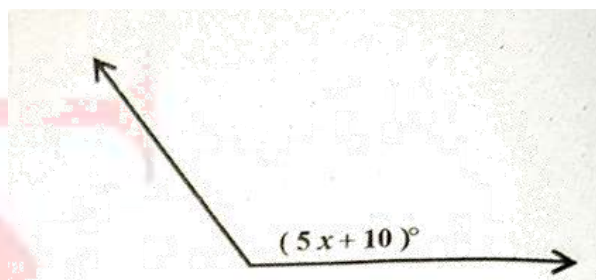
a) Represent R as a set of ordered pairs.

b) Find the range of the function.

23. In the opposite figure:

If $\angle A$ is an obtuse angle,

Find the possible values of x .



End of 1st monthQ1 Choose the correct answer:

1. What is the fourth proportional for the quantities 2, 4, 5?

- a) 12 b) 10 c) 3 d) 6

2. What is the S.S. for the equation: $\sqrt{5}x - 1 = 4$ in $\mathbb{R}$?

- a) {5} b) {4} c) $\emptyset$ d) $\{\sqrt{5}\}$

For more steps
watch 

3. If a is the first proportional for the two numbers 8, 16 what is the value of a?

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5. If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d} = \dots\dots$

- a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{3}{5}$ d) $\frac{5}{3}$

6. The first proportional for the quantities 2, 3, 6 is

- a) 1 b) 2 c) 8 d) 9

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- a) 5 b) 8 c) 9 d) 10

8. If $\frac{a}{4} = \frac{b}{3}$, then what is the value of $\frac{a+b}{a-b}$?

- a) $\frac{7}{3}$ b) $\frac{4}{3}$ c) $\frac{1}{7}$ d) 7

9. If $X = \{2\}, Y = \{3\}$, then $X \times Y = \dots\dots\dots$

- a) 6 b) {6} c) (2,3) d) {(2,3)}



10. What is the third proportional x^4 , $2x^3$?

- a) $2x^2$ b) $2x$ c) $4x^2$ d) $4x^3$

11. If : $n(X^2) = 9$, $n(X \times Y) = 12$, then $n(Y^2) = \dots\dots\dots$

- a) 6 b) 9 c) 16 d) 10

12. If : $X \times Y = \{(4, 5), (4, 7), (9, 7), (9, 5)\}$, then $X = \dots\dots\dots$

- a) $\{5, 9\}$ b) $\{4, 9\}$ c) $\{7, 5\}$ d) $\{7, 9\}$

13. If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y , where $R = \{(5, 9), (8, 9), (K, 9)\}$, what is the value of K ?

- a) 5 b) 7 c) 8 d) 9

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- a) $] -\infty, 5[$ b) $] 5, \infty[$ c) $[5, \infty[$ d) $] -\infty, 5]$

15. Which of the following cartesian product $(\frac{1}{5}, \sqrt{5})$ belong to ?

- a) $\mathbb{N} \times \mathbb{N}$ b) $\mathbb{Z} \times \mathbb{Z}$ c) $\mathbb{Q} \times \mathbb{Q}$ d) $\mathbb{R} \times \mathbb{R}$

16. If R to R and $f(x) = 5$, what is the value of $f(10) - f(7)$?

- a) 0 b) 3 c) 5 d) 17

17. If $5x - 2y = 0$, what is the value of $\frac{x}{y}$?

- a) $\frac{-5}{2}$ b) $\frac{-2}{5}$ c) $\frac{2}{5}$ d) $\frac{5}{2}$

18. If $3a = 5b = 4c$, then $a : b : c = \dots\dots\dots$

- a) 9:12:16 b) 20:12:15
c) 15:10:9 d) 8:5:3

19. What is the solution set of inequality $3 \geq x > -3$ in R ?

For more steps
watch 



- a) $] -3, 3[$ b) $] -3, 3]$ c) $[-3, 3[$ d) $[-3, 3]$

20. If $X = \{5, 3\}$, $Y = \{4, 8\}$, then $(4, 3) \in$

- a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2

Q2 Answer the following:

1. Find the value of x that makes the following numbers are proportional: x , 20, 30, 60.

$$x = 10$$

2. Find the value of x and y to make the quantities x , 6, 12, y are in continued proportion.

$$X = 3 \quad , \quad y = 24$$

3. If $x : y = 3 : 4$, find the value of: $(6x + 4y) : (3x + 2y)$.

$$= 2$$

4. If $X = \{1, 5, 6\}$, $Y = \{5, 7\}$, $Z = \{2, 3, 5\}$, find:

a) $(X \times Z) = \{(1, 3), (1, 2), (1, 5), (5, 2), (5, 3), (5, 5), (6, 2), (6, 3), (6, 5)\}$

b) $(X \cup Y) \times (X \cap Y) = \{(1, 5), (5, 5), (6, 5), (7, 5)\}$

c) $n(X^2) = 9$

d) $(X - Y) \times (Y - Z) = \{(1, 7), (6, 7)\}$

For more steps
watch 

5. Find the solution set in $\mathbb{R}$ for the equation: $6x + 3 = 2x + 11$.

$$S.S = \{2\}$$



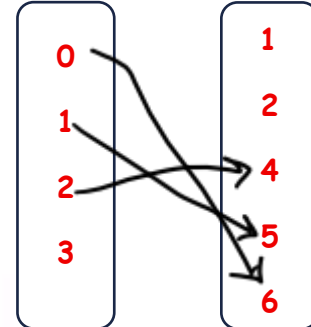
6. If $X = \{0, 1, 2, 3\}$, $Y = \{1, 2, 4, 5, 6\}$ and R is a relation from X to Y where xRy means: $x+y = 6$ for each $x \in X$, $y \in Y$.

a) Represent R as a set of ordered pairs.

$$R = \{(0, 6), (1, 5), (2, 4)\}$$

b) Write the relation in a table.

X	0	1	2
F(x)	6	5	4



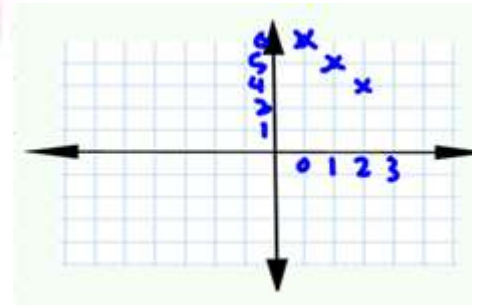
c) Represent the using the arrow diagram.

d) Represent the using the cartesian product.

e) State the domain and the range of the relation.

$$\text{Domain} = \{0, 1, 2, 3\}$$

$$\text{Range} = \{4, 5, 6\}$$



7. Find the number if added to the numbers 3,5,8,12 they will be proportional.

$$\text{The number} = 8$$

8. If b is the proportional mean between a and c , prove that $\frac{4a^2 - 9b^2}{4b^2 - 9c^2} = \frac{a}{c}$

$$\frac{4a^2 - 9b^2}{4b^2 - 9c^2} = \frac{4(ck^2)^2 - 9(ck)^2}{4(ck)^2 - 9c^2} = \frac{4c^2k^4 - 9c^2k^2}{4c^2k^2 - 9c^2} = \frac{c^2k^2(4k^2 - 9)}{c^2(4k^2 - 9)} = k^2$$

$$\frac{a}{c} = \frac{ck^2}{c} = k^2$$

9. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a+mb+5c}{25}$, find the value of m.

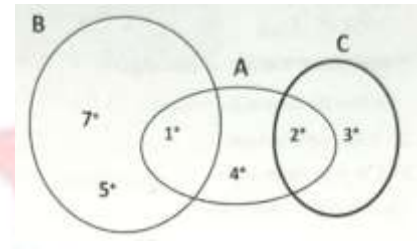
m = -3

10. Using the opposite Venn diagram:

a) $(A \cap C) \times B = \{(2, 1), (2, 5), (2, 7)\}$

b) $(C \cup B) \times A = \left\{ \begin{array}{l} (1, 1), (2, 1), (3, 1), (5, 1), (7, 1) \\ (1, 2), (2, 2), (3, 2), (5, 2), (7, 2) \\ (1, 4), (2, 4), (3, 4), (5, 4), (7, 4) \end{array} \right\}$

c) $n(A \times B) = 9$



11. If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$, find the value of z.

z = -15

For more steps
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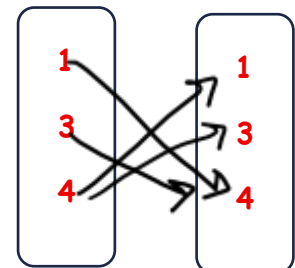
12. If the quantities a, b, c, d are proportional, prove that: $\frac{4b+7d}{4a+7c} = \frac{5b-8d}{5a-8c}$

Prove by yourself or watch the video on YouTube.

13. If $X = \{1, 3, 4\}$ and R is a relation on X where xRy means $(x + y)$ is an odd number for each $x \in X$, $y \in X$.

a) Represent R as a set of ordered pairs. = $\{(1, 4), (3, 4), (4, 1), (4, 3)\}$

b) Represent the relation using the arrow diagram.



c) Represent the relation using a graphically.

d) State the domain and the range of the relation.

domain = $\{1, 3, 4\}$

range = $\{1, 3, 4\}$

For more steps
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14. Find the value of x if the numbers x , 24, 144 are proportional.

$x = 4$

15. If $(x - 4, 9) = (5, x + y)$, find the value of: $\sqrt{4x + 2y}$.

$= 6$

16. If a , 3, 9, b are in continued proportion, find the value of a and b .

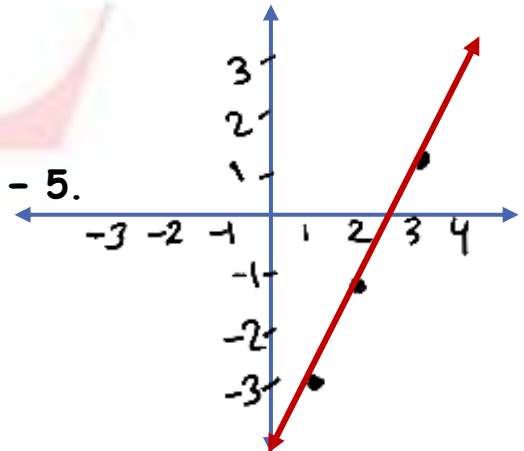
$a=1$ $b=27$

17. Find the S.S. in $\mathbb{R}$ for the following inequality and represent it on the number line: $2 \leq 3x - 1 \leq 14$

S.S = $[1, 5]$

18. Represent graphically the function: $f(x) = 2x - 5$.

x	1	2	3
$F(x)$	-3	-1	1



19. The following table is the set of ordered pairs for the function f where $f(x) = 3x + 4$ find the value of $a + b$

x	2	a	7
$f(x)$	10	16	b

$$a = 4, \quad b = 25, \quad a + b = 29$$

20. If $f(x) = 2x - b$, $f(3) = 10$, Find the value of $3b^2 - 5b + 7$.

$$b = -4, \quad \text{value} = 75$$

21. If $X = \{1, 3, 5\}$ and R is a function on X where: $R = \{(a, 3), (b, 1), (1, 5)\}$. Find $(a + b)$.

$$a + b = 8$$

For more steps
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22. If $X = \{1, 2, 3, 4, 5\}$, N is the set of natural numbers and f is a function from X to N where:

$$f(x) = x^2 - 1.$$

a) Represent R as a set of ordered pairs.

$$R = \{(1, 0), (2, 3), (3, 8), (4, 15), (5, 24)\}$$

b) Find the range of the function.

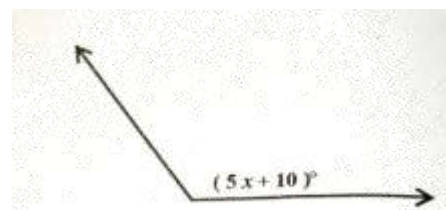
$$\text{Range} = \{0, 3, 8, 15, 24\}$$

23. In the opposite figure:

If $\angle A$ is an obtuse angle,

Find the possible values of x .

$$x \in]16, 34[$$



For more steps
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حمل الآن

مجاناً وحصرياً

المراجعة رقم (5)

اختبار شهر مارس



Model (1)
Question 1 : Choose the correct answer :

- ① If $\frac{a}{4} = \frac{b}{7}$ what is the value of $\frac{2a-b}{b-a}$?
 (a) $\frac{1}{3}$ (b) $\frac{8}{3}$ (c) $\frac{15}{7}$ (d) $\frac{15}{3}$
- ② If $3x = -7$, what is the value of $\frac{6x}{y}$?
 (a) 14 (b) $-\frac{7}{3}$ (c) $\frac{7}{3}$ (d) -14
- ③ If $x \times y = \{(5,2)\}$ what is the value of $n(x^2) \times n(y^2)$?
 (a) 100 (b) 10 (c) 1 (d) 29
- ④ If $3x = 5y = 4Z$ then $x:y:z$ equals
 (a) 9:12:16 (b) 15:10:9 (c) 20:12:15 (d) 8:5:3
- ⑤ If $8a = 2b$ what is the value of $\frac{a}{b}$?
 (a) $\frac{1}{2}$ (b) 4 (c) $\frac{3}{8}$ (d) $\frac{1}{4}$
- ⑥ If $\frac{a}{b} = \frac{b}{c}$ then $\frac{a}{b}$ equals?
 (a) b^2 (b) $\frac{a+b}{b+c}$ (c) $\frac{a^2}{b^2}$ (d) $\frac{ac}{b^2}$
- ⑦ If $n(x \times y) = 15y = \{1,0,-1\}$
 then , $n(x^2) =$
 (a) 5 (b) 9 (c) 15 (d) 25
- ⑧ What is the third proportional to the two quantities $x.2x^3$?
 (a) $4x^5$ (b) $2x^4$ (c) $2x^3$ (d) x^2
- ⑨ If $n(x^2) = 9$, $n(x+y) = 12$ then $n(y^2)$?
 (a) 4 (b) 6 (c) 9 (d) 16

Question 2 : Answer the following questions :

- ① Find the number that if added to the ratio 5: 11 become 4: 7

- 2 If a,b,c,d in a continued proportion
Prove that $\frac{a}{b+d} = \frac{c^3}{c^2d+d^3}$
- 3 If x,y,16 are in proportion $x+y=12$, each of x , y ?
- 4 If $\frac{x}{3} = \frac{y}{4} = \frac{2}{5}$ prove that : $\sqrt{x^2 + y^2} = 2x + y - Z$
- 5 If a,b,c are continued proportional Prove that : $\frac{b}{b+c} = \frac{a}{b+a}$
- 6 If $\frac{x}{y} = \frac{2}{3}$ find the value of the ratio $\frac{3x+2y}{6y-x}$
- 7 If $x = \{2, -1\}, y = \{4,0\}$
 $z = \{4,5, -2\}$ find :
1) $(y \cap z) \times x$
2) $n(y)^2$

Model (2)

Question 1 : Choose the correct answer :

- 1 If $\frac{a}{5} = \frac{b}{3}$ what is the value of $\frac{a+b}{a-b}$?
 (a) $\frac{8}{3}$ (b) $\frac{5}{3}$ (c) $\frac{1}{4}$ (d) 4
- 2 If $2a = 3b = 4c$ then a:b:c equals ?
 (a) 3,4,6 (b) 6,4,3 (c) 2,3,4 (d) 2,3,6
- 3 If $(3, \sqrt{4}) = (3,8)$ what is the value of $\sqrt[3]{y}$?
 (a) -4 (b) 4 (c) 8 (d) 64

- 4 If $(48, 2y) = (x^2 - 1, y)$ what is the value of xy ?
 (a) -7 (b) 7 (c) 14 (d) ± 14
- 5 What is the mean proportional between $3x^3, 27x$?
 (a) $9x^2$ (b) $\pm 9x^2$ (c) $9x^2$ (d) $\pm 6x^2$
- 6 If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{3}{4}$ what is the value of $\frac{a+3c+2e}{b+3d+2f}$
 (a) $\frac{c}{f}$ (b) $\frac{a}{d}$ (c) $\frac{3}{4}$ (d) $\frac{9}{16}$
- 7 If $n(x) = 3, n(x+y) = 12$ then $n(y) =$
 (a) 4 (b) 9 (c) 15 (d) 36
- 8 If $(x, y-1) = (4, 3)$ then $\frac{x}{y} =$
 (a) 1 (b) 2 (c) 3 (d) 4
- 9 If $\frac{x}{4} = \frac{y}{3} = \frac{x+5y}{m}$ what is the value of m ?
 (a) 7 (b) 10 (c) 12 (d) 19

Question 2 : Answer the following questions :

- 1 If b is a mean proportional between a, c prove that :

$$\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{2a}{c}$$
- 2 If $7, x, \frac{1}{y}$ continued proportion find : $x^4 y^2$
- 3 IF a, b, c, d are proportional prove : $\frac{a+d}{b-c+d} = \frac{a-c}{b-c}$
- 4 IF $\frac{2a-7b}{2a+7b} = \frac{2c-7b}{2c+7b}$ then prove that the quantities a, b, c, d are proportional:
- 5 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{6} = \frac{4x-2y+z}{k+5}$ find the value of k
- 6 If $\frac{3}{x} = \frac{4}{y} = \frac{5}{7}$ prove $\sqrt{x^2 + y^2} = 2x + y - z$

- 7 IF $x = \{6,4,8\}$, $y = \{3,4,5\}$ find each of the following and represent it :
 1) $(xny)Xy$
 2) $(x - y) \times y$

Model (3)

Question 1 : Choose the correct answer :

- 1 If $2x = 7y$ what is the value of $\left(\frac{x}{y}\right)^{-1}$?
 (a) $\frac{2}{7}$ (b) $\frac{7}{2}$ (c) $\frac{49}{4}$ (d) $\frac{4}{49}$
- 2 If $\frac{a}{3} = \frac{b}{5}$, $5a - 2b = 20$ what is the value of b ?
 (a) 3 (b) 5 (c) 15 (d) 20
- 3 If $4x^2 = 9y^2$ what is the value of $\frac{x}{y}$?
 (a) $\frac{9}{4}$ (b) $\frac{3}{2}$ (c) $\pm \frac{2}{3}$ (d) $\pm \frac{3}{2}$
- 4 If $\frac{a}{3} = \frac{b}{m} = \frac{2a+3b}{21}$ what is the value of m ?
 (a) 3 (b) 5 (c) 10 (d) 15
- 5 If $\frac{a}{b} = \frac{2}{7}$ what is the value of $\frac{2b}{7a}$?
 (a) $\frac{4}{49}$ (b) $\frac{2}{7}$ (c) 1 (d) $\frac{49}{4}$
- 6 If a,b,c,d are proportional quantities then : $ad = bc$
 (a) $\frac{b}{d} = \frac{a}{c}$ (b) $\frac{a}{c} = \frac{d}{b}$ (c) $\frac{b}{c} = \frac{a}{d}$ (d) $ab = cd$
- 7 If $\frac{a}{c+a-b} = \frac{b}{a+b-c} = \frac{c}{b+c-a}$ then each ratio equals :
 (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) 1
- 8 What is the mean proportional between $4(x + y^2)$, $25(x - y^2)$
 (a) $100(x + y)^2$ (b) $100(x - y)^2$
 (c) $\pm 100(x - y)^2$ (d) $\pm 100(x^2 - y^2)$
- 9 If $(2^x - 1, -3) = (1, y)$ what is the value of $2x - y$
 (a) -3 (b) -1 (c) 3 (d) 5

Question 2 : Answer the following questions :

- ① If 4,x,y,32 are in continued proportion , then find the value of each of x,y ?
- ② Find the number which if subtracted from each of the number 21,15,11 makes them in continued proportion $21 - k = 15 - k , 11 - k$
- ③ If $\frac{a}{2x+y} , \frac{b}{x+2y}$ prove that $b = (x + 2y)k$
- ④ If $\frac{a}{b} = \frac{3}{5}$ find the value of $\frac{20a-7b}{15a+b}$
- ⑤ If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$ and $x + y - 2z = 12$,
Find the value of z ?
- ⑥ The first proportion for the number $\sqrt{8}, 7, 14\sqrt{2}$
- ⑦ If $a + b + c = 26, 8a = 12b = 3c$
Find the value of each of a,b,c , Lcm=24

Model (4)

Question 1 : Choose the correct answer :

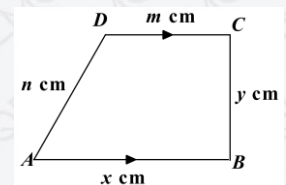
- ① Which of the following ordered pairs does not belong to $Q \times Q$?
 (a) $\left(\frac{-3}{2}, \frac{1}{4}\right)$ (b) $\left(-\sqrt{\frac{1}{9}}, -9\right)$ (c) $(\sqrt{12}, -5)$ (d) $\left(\sqrt[3]{27}, \frac{\sqrt[3]{-1}}{8}\right)$
- ② If $n(x^2) = 9, n(y^2) = 16$ then $n = (y \times x) = \dots$
 (a) 7 (b) 12 (c) 36 (d) 144
- ③ If $(28, 2y) = (x^2 - 1, 4)$ what is the value of xy ?
 (a) -7 (b) 7 (c) 14 (d) ± 14

- 4 If $x, 8, x^2$ are in proportion, then $x = \dots$
- (a) $8x^3$ (b) 8 (c) x^3 (d) 4
- 5 If $\frac{3}{m} = \frac{7}{n}, n - m = 20$ what is the value of ?
- (a) 4 (b) 12 (c) 15 (d) 35
- 6 If $a : b = c : d$ then $\frac{2a+5c}{2b+5d}$ does not equal
- (a) $\frac{a}{b}$ (b) $\frac{c}{d}$ (c) $\frac{a+c}{b+d}$ (d) $\frac{a-c}{d-b}$
- 7 If $\frac{a}{b} = \frac{b}{c} = \frac{4}{5}$ and $a + b + c = 122$ what is the value of a ?
- (a) 4 (b) 132 (c) 40 (d) 50
- 8 If $\frac{a}{b} = \frac{b}{c} = 3$ then which of the following is correct ?
- (a) $a = 3c$ (b) $a = 9b$ (c) $a = 9c$ (d) $a = 6c$
- 9 If $a : b = b : c$ then $a^4 : b^4$ equals ?
- (a) $ac : b^2$ (b) $a^2 : c^2$ (c) $c^2 : b^2$ (d) $b^2 = ac$

Question 2 : Answer the following questions :

- 1 Find the value of y that makes the quantities :
10 , 2y , 3y , 15 are proportional
- 2 If a,b,c,d are proportional quantities prove $\frac{a+c}{b+d} = \frac{a^2+c^2}{ab+cd}$
- 3 If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a+mb+5c}{25}$ find the value of m ?

- 4 Is the given figure :
ABCD is a right - angled trapezium at B , perimeter equals 36cm
If $10x = 15y = 20cm = 12n$, find x,y,m,n



- 5 If 3, L , 12 , M are in continued proportion , find the value of each of L , m ?

- ⑥ If the quantities 35,15,3,2x+1 are proportional m then find the numerical value of x ?
- ⑦ If $x = \{2,3,4\}$, $y = \{a,b\}$ find:
- 1) $y^2 = \dots$
- 2) $n(x^2) = \dots$

Model (5)

Question 1 : Choose the correct answer :

- ① If $x = \{1,2\}$ then $x \times \phi =$
- (a) x (b) $\emptyset$ (c) $\{0\}$ (d) $\{(1,0), (2,0)\}$
- ② If $x = \{2,3,4,7,8\}$, $y = \{1,4,5,6\}$ then $n(x^2) - n(x \times y)$
- (a) 5 (b) 10 (c) 15 (d) 25
- ③ If $\frac{5a-7b}{2a+3b} = 0$ what is the value of $\frac{a}{b}$?
- (a) $\frac{5}{7}$ (b) $\frac{7}{5}$ (c) $\frac{2}{3}$ (d) $\frac{3}{2}$
- ④ If $\frac{a}{2} = \frac{b}{8} = \frac{a+\frac{1}{4}b}{x}$ what is the value of x ?
- (a) 4 (b) 6 (c) 8 (d) 10
- ⑤ If $\frac{5}{x} = \frac{6}{y}$ what is the value of $\frac{2x+y}{y-x}$?
- (a) 5 (b) $\frac{11}{16}$ (c) $\frac{16}{11}$ (d) 16
- ⑥ What is the mean proportional between a , c ?
- (a) $\sqrt{a+c}$ (b) $\frac{a+c}{2}$ (c) $\pm\sqrt{ac}$ (d) ac
- ⑦ What is the following numbers are proportional ?
- (a) 2,6,4 (b) 3,5,8 (c) 3,9,27 (d) 1,4,9
- ⑧ If x is the positive mean proportional between 24,54 what is the value of x ?
- (a) 15 (b) 36 (c) 39 (d) 78

- 9 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = \frac{1}{4}$ so what is the value $\frac{a+b+c}{b+c+d}$?
- (a) $\frac{1}{8}$ (b) $\frac{1}{64}$ (c) $\frac{1}{4}$ (d) $\frac{3}{4}$

Question 2 : Answer the following questions :

- 1 If $x = \{1, 2, 3\}$, $y = \{a, b, c\}$
How many ordered Pairs $(x, y) \in x \times y$ satisfying that the first projection is an odd number and the second projection is not b ?
- 2 If $x \times y = \{(2,6), (2,7), (3,6), (3,9), (5,6), (5,9)\}$, then find each of x,y?
- 3 If 3,a,b,81 are in continued proportion , then find the value of each of a, b?
- 4 If x , y , 5 are in proportion $x + y = 30$, then find each of x , y ?
- 5 If b is the mean proportional between a , c prove $\frac{a-b}{a} = \frac{a-c}{a+b}$
- 6 If $a : b = 3 : 5$ find the value of $20a - 7b : 15a + b$
- 7 Find the number which if added to each of the numbers 1,13,7,31 they become proportional numbers

Model (1)

Question 1 : Choose the correct answer :

- 1 If $\frac{a}{4} = \frac{b}{7}$ what is the value of $\frac{2a-b}{b-a}$? $a=4k$ $b=7k$
 - (a) $\frac{1}{3}$
 - (b) $\frac{8}{3}$
 - (c) $\frac{15}{7}$
 - (d) $\frac{15}{3}$
- 2 If $3x = -7$, what is the value of $\frac{6x}{y}$?
 - (a) 14
 - (b) $-\frac{7}{3}$
 - (c) $\frac{7}{3}$
 - (d) -14
- 3 If $x \times y = \{(5,2)\}$ what is the value of $n(x^2) \times n(y^2)$?
 - (a) 100
 - (b) 10
 - (c) 1
 - (d) 29
- 4 If $3x = 5y = 4Z$ then $x:y:z$ equals
 - (a) 9:12:16
 - (b) 15:10:9
 - (c) 20:12:15
 - (d) 8:5:3
- 5 If $8a = 2b$ what is the value of $\frac{a}{b}$?
 - (a) $\frac{1}{2}$
 - (b) 4
 - (c) $\frac{3}{8}$
 - (d) $\frac{1}{4}$
- 6 If $\frac{a}{b} = \frac{b}{c}$ then $\frac{a}{b}$ equals?
 - (a) b^2
 - (b) $\frac{a+b}{b+c}$
 - (c) $\frac{a^2}{b^2}$
 - (d) $\frac{ac}{b^2}$
- 7 If $n(x \times y) = 15y = \{1,0,-1\}$
then , $n(x^2) =$
 - (a) 5
 - (b) 9
 - (c) 15
 - (d) 25
- 8 What is the third proportional to the two quantities $x.2x^3$?
 - (a) $4x^5$
 - (b) $2x^4$
 - (c) $2x^3$
 - (d) x^2
- 9 If $n(x^2) = 9$, $n(x+y) = 12$ then $n(y^2)$?
 - (a) 4
 - (b) 6
 - (c) 9
 - (d) 16

Question 2 : Answer the following questions :

- 1 Find the number that if added to the ratio 5: 11 become 4: 7

$$\frac{5+x}{11+x} = \frac{4}{7} \rightarrow 7(5+x) = 4(11+x)$$

$$7x + 35 = 44 + 4x$$

$$3x = 9 \quad x = 3$$

2

If a,b,c,d in a continued proportion

Prove that $\frac{a}{b+d} = \frac{c^3}{c^2d+d^3}$

$$a = dk^3 \quad b = dk^2 \quad c = dk$$

$$\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = k$$

$$L \cdot H \cdot S = \frac{(dk^3)}{dk^2 + d} = \frac{dk^3}{d(k^2 + 1)} = \frac{k^3}{k^2 + 1}$$

$$R \cdot H \cdot S = \frac{(dk)^3}{d^2k^2 \cdot d + d^3} = \frac{d^3k^3}{d^3(k^2 + 1)} = \frac{k^3}{k^2 + 1}$$

L.H.S = R.H.S

3

If x,y,16 are in proportion $x+y=12$, each of x, y ?

$$\frac{x}{y} = \frac{y}{16} \rightarrow y^2 = 16x$$

$$x = \frac{y^2}{16} \quad \frac{y^2}{16} + y = 12 \rightarrow y^2 + 16y = 192$$

$$y^2 + 16y - 192 = 0 \rightarrow (y + 24)(y - 8) = 0$$

$$y = -24, \quad y = 8$$

$$x = 36, \quad x = 4$$

4

If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$ prove that : $\sqrt{x^2 + y^2} = 2x + y - z$

$$\frac{x}{3} = \frac{y}{4} = \frac{z}{5} = k$$

$$x = 3k, \quad y = 4k, \quad z = 5k$$

$$L \cdot H \cdot S = \sqrt{x^2 + y^2} = \sqrt{(3k)^2 + (4k)^2} = \sqrt{25k^2} = 5k$$

$$R \cdot H \cdot S = 2(3k) + 4k - 5k = 5k + 4k - 5k = 5k$$

$$L.H.S = R.H.S$$

5

If a,b,c are continued proportional Prove that : $\frac{b}{b+c} = \frac{a}{b+a}$

$$\frac{9}{b} = \frac{b}{c} = k$$

$$b = cka = ck^2$$

$$L \cdot H \cdot S = \frac{ck}{c + ck} = \frac{ck}{c(1 + k)} = \frac{k}{1 + k}$$

$$R.H.S = \frac{ck^2}{ck + ck^2} = \frac{ck^2}{ck(1 + k)} = \frac{k}{1 + k}$$

$$L.H.S = R.H.S$$

6 If $\frac{x}{y} = \frac{2}{3}$ find the value of the ratio $\frac{3x+2y}{6y-x}$

$$\begin{aligned} x &= 2ky = 3k \\ \frac{3(2k) + 2(3k)}{6(3k) - 2k} &= \frac{6k + 6k}{18k - 2k} = \frac{12k}{16k} = \frac{3}{4} \end{aligned}$$

7 If $x = \{2, -1\}$, $y = \{4, 0\}$ find :
 $z = \{4, 5, -2\}$

$$1) (y \cap z) \times x$$

$$y \cap z = \{4\}$$

$$[4 \times \{2, -1\}] = \{(4, 2), (4, -1)\}$$

$$2) n(y)^2$$

$$n(y) = 2 \rightarrow n(y^2) = 4$$

Model (2)

Question 1 : Choose the correct answer :

1 If $\frac{a}{5} = \frac{b}{3}$ what is the value of $\frac{a+b}{a-b}$?

(a) $\frac{8}{3}$

(b) $\frac{5}{3}$

(c) $\frac{1}{4}$

(d) 4

2 If $2a = 3b = 4c$ then a:b:c equals ?

(a) 3,4,6

(b) 6,4,3

(c) 2,3,4

(d) 2,3,6

- 3 If $(3, \sqrt{4}) = (3, 8)$ what is the value of $\sqrt[3]{y}$?
 (a) -4 (b) **4** (c) 8 (d) 64
- 4 If $(48, 2y) = (x^2 - 1, y)$ what is the value of xy ?
 (a) -7 (b) 7 (c) 14 (d) **± 14**
- 5 What is the mean proportional between $3x^3, 27x$?
 (a) $9x^2$ (b) **$\pm 9x^2$** (c) $9x^2$ (d) $\pm 6x^2$
- 6 If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{3}{4}$ what is the value of $\frac{a+3c+2e}{b+3d+2f}$?
 (a) $\frac{c}{f}$ (b) $\frac{a}{d}$ (c) **$\frac{3}{4}$** (d) $\frac{9}{16}$
- 7 If $n(x) = 3, n(x+y) = 12$ then $n(y) =$
 (a) **4** (b) 9 (c) 15 (d) 36
- 8 If $(x, y-1) = (4, 3)$ then $\frac{x}{y} =$
 (a) **1** (b) 2 (c) 3 (d) 4
- 9 If $\frac{x}{4} = \frac{y}{3} = \frac{x+5y}{m}$ what is the value of m ?
 (a) 7 (b) 10 (c) 12 (d) **19**

Question 2 : Answer the following questions :

- 1 If b is a mean proportional between a, c prove that :

$$\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{2a}{c}$$

$$\begin{aligned}
 & b^2 = ac \\
 L \cdot H \cdot S &= \frac{a^2}{ac} + \frac{ac}{c^2} = \frac{a}{c} + \frac{a}{c} \\
 R \cdot H \cdot S &= \frac{2a}{c} \\
 & L.H.S = R.H.S
 \end{aligned}$$

- 2 If $7, x, \frac{1}{y}$ continued proportion find : $x^4 y^2$

$$\begin{aligned}
 \frac{7}{x} &= \frac{x}{\frac{1}{y}} \rightarrow x^2 = \frac{7}{y} \\
 x^2 y &= 7 \rightarrow (x^2 y)^2 = (7)^2 = 49 \\
 &= x^4 y^2
 \end{aligned}$$

3 IF a, b, c, d are proportional prove : $\frac{a+d}{b-c+d} = \frac{a-c}{b-c}$

$$\begin{aligned} a &= dK^3 & c &= dk & b &= dK^2 \\ \frac{a}{b} &= \frac{b}{c} = \frac{c}{d} = k \\ L \cdot H \cdot S &= \frac{dk^3 + d}{dk^2 - dk + d} = \frac{d(k+1)(k^2 - k + 1)}{d(k^2 - k + 1)} \\ &= k + 1 \rightarrow R.H.S = \frac{dk^3 - dk}{dk^2 - dk} = \frac{dk(k-1)(k+1)}{dk(k-1)} \\ &= K + 1 \rightarrow L.H.S = R.H.S = K + 1 \end{aligned}$$

4 IF $\frac{2a-7b}{2a+7b} = \frac{2c-7d}{2c+7d}$ then prove that the quantities a, b, c, d are proportional:

$$\begin{aligned} (2a - 7b)(2c + 7d) &= (2a + 7b)(2c - 7d) \\ 4ac + 14ad - 14bc - 49bd &= 4ac - 14ad + 14bc - 49bd \\ bc - 49bd &\rightarrow 14ad + 14ad = 14bc + 14bc \\ 28ad &= 28bc \rightarrow ad = bc \\ \frac{a}{b} &= \frac{c}{d} \end{aligned}$$

5 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{6} = \frac{4x-2y+z}{k+5}$ find the value of k

$$\begin{aligned} x &= 3t, & y &= 4t, & z &= 6t \\ \frac{x}{3} &= \frac{y}{4} = \frac{z}{6} = t \\ \frac{4x - 2y + z}{k + 5} &= \frac{4(3t) - 2(4t) + 6t}{k + 5} = t \\ \frac{12t - 8t + 6t}{k + 5} &= t = \frac{10t}{k + 5} = t \\ \frac{10}{k + 5} &= 1 \rightarrow k + 5 = 10 \\ k &= 5 \end{aligned}$$

6 If $\frac{3}{x} = \frac{4}{y} = \frac{5}{z}$ prove $\sqrt{x^2 + y^2} = 2x + y - z$

$$\begin{aligned} x &= 3ky = 4kz = 5k \\ L \cdot H \cdot S &= \sqrt{x^2 + y^2} = \sqrt{9k^2 + 16k^2} = \sqrt{25k^2} = 5k \\ R \cdot H \cdot S &= 2(3k) + 4k - 5k = 6k + 4k - 5k = 5K \\ L.H.S &= R.H.S = 5K \end{aligned}$$

7 IF $x = \{6, 4, 8\}$, $y = \{3, 4, 5\}$ find each of the following and represent it :
1) $(xny)Xy$
 $xny = \{4\}$

$$\{4\} \times \{3,4,5\} = \{(3,4), (4,4), (4,5)\}$$

$$2)(x - y) \times y$$

$$(x - y) = \{6,8\}$$

$$\{6,8\} \times \{3,4,5\} = \{(6,3), (6,4), (6,5), (8,3), (8,4), (8,5)\}$$

Model (3)

Question 1 : Choose the correct answer :

- 1 If $2x = 7y$ what is the value of $\left(\frac{x}{y}\right)^{-1}$?
 (a) $\frac{2}{7}$ (b) $\frac{7}{2}$ (c) $\frac{49}{4}$ (d) $\frac{4}{49}$
- 2 If $\frac{a}{3} = \frac{b}{5}$, $5a - 2b = 20$ what is the value of b ?
 (a) 3 (b) 5 (c) 15 (d) 20
- 3 If $4x^2 = 9y^2$ what is the value of $\frac{x}{y}$?
 (a) $\frac{9}{4}$ (b) $\frac{3}{2}$ (c) $\pm \frac{2}{3}$ (d) $\pm \frac{3}{2}$
- 4 If $\frac{a}{3} = \frac{b}{m} = \frac{2a+3b}{21}$ what is the value of m ?
 (a) 3 (b) 5 (c) 10 (d) 15
- 5 If $\frac{a}{b} = \frac{2}{7}$ what is the value of $\frac{2b}{7a}$?
 (a) $\frac{4}{49}$ (b) $\frac{2}{7}$ (c) 1 (d) $\frac{49}{4}$
- 6 If a,b,c,d are proportional quantities then : $ad = bc$
 (a) $\frac{b}{d} = \frac{a}{c}$ (b) $\frac{a}{c} = \frac{d}{b}$ (c) $\frac{b}{c} = \frac{a}{d}$ (d) $ab = cd$
- 7 If $\frac{a}{c+a-b} = \frac{b}{a+b-c} = \frac{c}{b+c-a}$ then each ratio equals :
 (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) 1
- 8 What is the mean proportional between $4(x + y^2)$, $25(x - y^2)$
 (a) $100(x + y)^2$ (b) $100(x - y)^2$
 (c) $\pm 100(x - y)^2$ (d) $\pm 100(x^2 - y^2)$

- 9 If $(2^x - 1, -3) = (1, y)$ what is the value of $2x - y$
- (a) -3 (b) -1 (c) 3 (d) 5

Question 2 : Answer the following questions :

- 1 If 4,x,y,32 are in continued proportion , then find the value of each of x,y ?

$$x^2 = 4y$$

$$y = \frac{x^2}{4}$$

$$\frac{4}{x} = \frac{x}{y} = \frac{y}{32}$$

$$y^2 = 32x \rightarrow \left(\frac{x^2}{4}\right)^2 = 32x$$

$$\frac{x^4}{16} = 32 \rightarrow x^4 = 512x = x^3 = 512$$

$$x = 8, y = 16$$

- 2 Find the number which if subtracted from each of the number 21,15,11 makes them in continued proportion $21 - k = 15 - k, 11 - k$

$$(15 - k)^2 = (21 - k)(11 - k)$$

$$231 - 32k + k^2 = 225 - 30k + k^2$$

$$225 - 30k = 231 - 32k$$

$$2k = 6, k = 3$$

- 3 If $\frac{a}{2x+y}, \frac{b}{x+2y}$ prove that $b = (x + 2y)k$

$$\frac{u+b}{a-b} = \frac{3x+3y}{x-y} a = (2x+y)k$$

$$L \cdot H \cdot S = \frac{(2x+y)k + (x+2y)k}{(2x+y)k - (x+2y)k} = \frac{k[3x+3y]}{k[x-y]}$$

$$\frac{3x+3y}{x-y}$$

$$L.H.S = R.H.S$$

- 4 If $\frac{a}{b} = \frac{3}{5}$ find the value of $\frac{20a-7b}{15a+b}$

$$a = 3k, b = 5k$$

$$\frac{20(3k) - 7(5k)}{15(3k) + (5k)} = \frac{60k - 35k}{45k + 5k}$$

- 5 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$ and $x + y - 2z = 12$,
Find the value of z ?

$$\frac{25k}{50k} = \frac{1}{2}$$

$$\begin{aligned} x &= 2k & y &= 4k & z &= 5k \\ 2k + 4k - 2(5)k &= 12 \\ 6k - 10k &= 12 \\ -4k &= 12 & k &= -3 \\ z &= 5(-3) = -15 \end{aligned}$$

- 6 The first proportion for the number $\sqrt{8}, 7, 14\sqrt{2}$

$$\begin{aligned} \frac{x}{\sqrt{8}} &= \frac{7}{14\sqrt{2}} & x &= \frac{7\sqrt{8}}{14\sqrt{2}} \\ x &= \frac{14\sqrt{2}}{14\sqrt{2}} = 1 \end{aligned}$$

- 7 If $a + b + c = 26, 8a = 12b = 3c$
Find the value of each of a, b, c , $\text{Lcm} = 24$

$$\begin{aligned} 8a &= 12b = 3c = k \\ \frac{8a}{24} &= \frac{12b}{24} = \frac{3c}{24} \rightarrow \frac{a}{3} = \frac{b}{2} = \frac{c}{8} = k \\ a &= 3kb = 2Kc = \rho k \\ 3k + 2k + 8k &= 26 \rightarrow 13k = 26 = k = 2 \end{aligned}$$

$$\begin{aligned} a &= 6 \\ b &= 4 \\ c &= 16 \end{aligned}$$

Model (4)

Question 1 : Choose the correct answer :

- 1 Which of the following ordered pairs does not belong to $\mathbb{Q} \times \mathbb{Q}$?
 (a) $(\frac{-3}{2}, \frac{1}{4})$ (b) $(-\sqrt{\frac{1}{9}}, -9)$ (c) $(\sqrt{12}, -5)$ (d) $(\sqrt[3]{27}, \frac{\sqrt[3]{-1}}{8})$
- 2 If $n(x^2) = 9, n(y^2) = 16$ then $n = (y \times x) = \dots$
 (a) 7 (b) 12 (c) 36 (d) 144
- 3 If $(28, 2y) = (x^2 - 1, 4)$ what is the value of xy ?
 (a) -7 (b) 7 (c) 14 (d) ± 14

- 4 If $x, 8, x^2$ are in proportion, then $x = \dots$
- (a) $8x^3$ (b) 8 (c) x^3 (d) 4
- 5 If $\frac{3}{m} = \frac{7}{n}, n - m = 20$ what is the value of ?
- (a) 4 (b) 12 (c) 15 (d) 35
- 6 If $a:b = c:d$ then $\frac{2a+5c}{2b+5d}$ does not equal
- (a) $\frac{a}{b}$ (b) $\frac{c}{d}$ (c) $\frac{a+c}{b+d}$ (d) $\frac{a-c}{d-b}$
- 7 If $\frac{a}{b} = \frac{b}{c} = \frac{4}{5}$ and $a + b + c = 122$ what is the value of a ?
- (a) 4 (b) 132 (c) 40 (d) 50
- 8 If $\frac{a}{b} = \frac{b}{c} = 3$ then which of the following is correct ?
- (a) $a = 3c$ (b) $a = 9b$ (c) $a = 9c$ (d) $a = 6c$
- 9 If $a:b = b:c$ then $a^4:b^4$ equals ?
- (a) $ac:b^2$ (b) $a^2:c^2$ (c) $c^2:b^2$ (d) $b^2 = ac$

Question 2 : Answer the following questions :

- 1 Find the value of y that makes the quantities :
 10, $2y$, $3y$, 15 are proportional

$$\frac{10}{2y} = \frac{3y}{15} \rightarrow 6y^2 = 150$$

$$y^2 = 25$$

$$y = \pm 5$$

- 2 If a, b, c, d are proportional quantities prove $\frac{a+c}{b+d} = \frac{a^2+c^2}{ab+cd}$

$$\frac{a}{b} = \frac{c}{d} = ka = b_{k,c} = dk$$

$$L.H.S = \frac{a+c}{b+d} = \frac{bk + dk}{b + 0} = \frac{k(b+d)}{b+d} = K$$

$$R.H.S = \frac{a^2 + c^2}{ab + cd} = \frac{b^2k^2 + d^2k^2}{b^2k + d^2k} = \frac{k^2(b+d)}{(b+d)} = k$$

$$L.H.S = R.H.S$$

- 3 If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a+mb+5c}{25}$ find the value of m ?

first ratio $x4$, second xm , third $x5$

$$\frac{4a}{12} = \frac{mb}{4m} = \frac{5c}{25} \rightarrow \frac{4a + mb + sc}{12 + 4m + 25}$$

$$12 + 4m + 25 = 25 \rightarrow 4m + 12 = 0$$

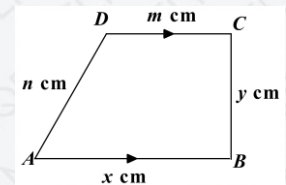
$$m = -3$$

4

Is the given figure :

$ABCD$ is a right - angled trapezium at B , perimeter equals $36cm$

If $10x = 15y = 20cm = 12n$, find x,y,m,n



$$\frac{10x}{60} = \frac{15y}{60} = \frac{20}{60} = \frac{12n}{60} \rightarrow \frac{x}{6} = \frac{y}{4} = \frac{m}{3} = \frac{n}{5}$$

$$\frac{x + y + m + n}{6 + 4 + 3 + 5} = \frac{36}{18} = 2$$

$$x = 2 \times 6 = 12$$

$$y = 2 \times 4 = 8$$

$$n = 2 \times 3 = 6$$

5

If $3, L, 12, M$ are in continued proportion , find the value of each of L, m ?

$$\frac{3}{L} = \frac{12}{m} = \frac{L}{12}$$

$$L^2 = 3 \times 12 \rightarrow L = \pm\sqrt{3 \times 12} = \pm\sqrt{36} = \pm 6$$

$$m = \frac{12 \times 12}{\pm 6} = \pm 24$$

6

If the quantities $35, 15, 3, 2x+1$ are proportional then find the numerical value of x ?

$$\frac{35}{15} = \frac{3}{2x+1}$$

$$70x + 35 = 45 \rightarrow 70x = 10$$

$$x = \frac{1}{7}$$

7

If $x = \{2, 3, 4\}$, $y = \{a, b\}$ find:

$$1) y^2 = \{(a, a), (a, b), (b, b), (b, a)\}$$

$$2) n(x^2) = 3^2 = 9$$

Model (5)

Question 1 : Choose the correct answer :

- 1 If $x = \{1,2\}$ then $x \times \phi = \dots$
 - (a) x
 - (b) $\emptyset$
 - (c) $\{0\}$
 - (d) $\{(1,0), (2,0)\}$
- 2 If $x = \{2,3,4,7,8\}$, $y = \{1,4,5,6\}$ then $n(x^2) - n(x \times y)$
 - (a) 5
 - (b) 10
 - (c) 15
 - (d) 25
- 3 If $\frac{5a-7b}{2a+3b} = 0$ what is the value of $\frac{a}{b}$?
 - (a) $\frac{5}{7}$
 - (b) $\frac{7}{5}$
 - (c) $\frac{2}{3}$
 - (d) $\frac{3}{2}$
- 4 If $\frac{a}{2} = \frac{b}{8} = \frac{a+\frac{1}{4}b}{x}$ what is the value of x ?
 - (a) 4
 - (b) 6
 - (c) 8
 - (d) 10
- 5 If $\frac{5}{x} = \frac{6}{y}$ what is the value of $\frac{2x+y}{y-x}$?
 - (a) 5
 - (b) $\frac{11}{16}$
 - (c) $\frac{16}{11}$
 - (d) 16
- 6 What is the mean proportional between a , c ?
 - (a) $\sqrt{a+c}$
 - (b) $\frac{a+c}{2}$
 - (c) $\pm\sqrt{ac}$
 - (d) ac
- 7 What is the following numbers are proportional ?
 - (a) 2,6,4
 - (b) 3,5,8
 - (c) 3,9,27
 - (d) 1,4,9
- 8 If x is the positive mean proportional between 24,54 what is the value of x ?
 - (a) 15
 - (b) 36
 - (c) 39
 - (d) 78
- 9 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = \frac{1}{4}$ so what is the value $\frac{a+b+c}{b+c+d}$?
 - (a) $\frac{1}{8}$
 - (b) $\frac{1}{64}$
 - (c) $\frac{1}{4}$
 - (d) $\frac{3}{4}$

Question 2 : Answer the following questions :

- 1 If $x = \{1, 2, 3\}, y = \{a, b, c\}$
 How many ordered Paris $(x, y) \in x \times y$ satisfying that the first projection is an odd number and the second projection is not b ?
 $\{1, 3\} = \{a, c\}$

number of ordered pairs $2 \times 2 = 4$

- ② If $x \times y = \{(2,6), (2,7), (3,6), (3,9), (5,6), (5,9)\}$, then find each of x,y?
 $x = \{2,3,5\}$ $y = \{6,9\}$

- ③ If 3,a,b,81 are in continued proportion, then find the value of each of a, b?

$$\frac{3}{a} = \frac{a}{b} = \frac{b}{81} = k$$

$$3 = 81k^3 \quad k^3 = \frac{3}{81} \rightarrow k = 3$$

$$3 = 81k^2 = 81\left(\frac{1}{3}\right)^2 = 9$$

$$b = 81k = 81\left(\frac{1}{3}\right) = 27$$

$$\begin{array}{r} 3 \overline{) \frac{3}{81}} \\ 3 \overline{) \frac{3}{27}} \\ = 1/3 \end{array}$$

- ④ If x, y, 5 are in proportion $x + y = 30$, then find each of x, y?

$$\frac{x}{y} = \frac{y}{5} \quad y^2 = 5x \quad x = \frac{y^2}{5}$$

$$\frac{y^2}{5} + y = 30$$

$$y^2 - 5y - 30 = 0$$

$$(y + 15)(y - 10) = 0$$

$$y = -15 \quad y = 10$$

$$x = 45 \quad x = 20$$

$$(20,10) - (45,-15)$$

- ⑤ If b is the mean proportional between a, c prove $\frac{a-b}{a} = \frac{a-c}{a+b}$

$$\frac{a}{b} = \frac{b}{c} = k \quad b = ck \quad a = ck^2$$

$$L \cdot H \cdot S = \frac{ck^2 - ck}{ck^2} = \frac{ck(k-1)}{ck^2} = \frac{k-1}{k}$$

$$R.H.S = \frac{ck^2 - ck^2}{ck^2 + ck} = \frac{c(k^2 - 1)}{ck(k+1)} = \frac{c(k-1)(k+1)}{ck(k+1)} = \frac{k-1}{K}$$

$$L.H.S = R.H.S$$



If $a:b = 3:5$ find the value of $20a - 7b:15a + b$

$$\begin{aligned} \frac{a}{b} &= \frac{3}{5} = k & a &= 3K & b &= 5K \\ \frac{20(3K) - 7(5K)}{15(3K) + 15K} &= \frac{60K - 35K}{45K - 15K} \\ \frac{25K}{50K} &= \frac{1}{2} \end{aligned}$$



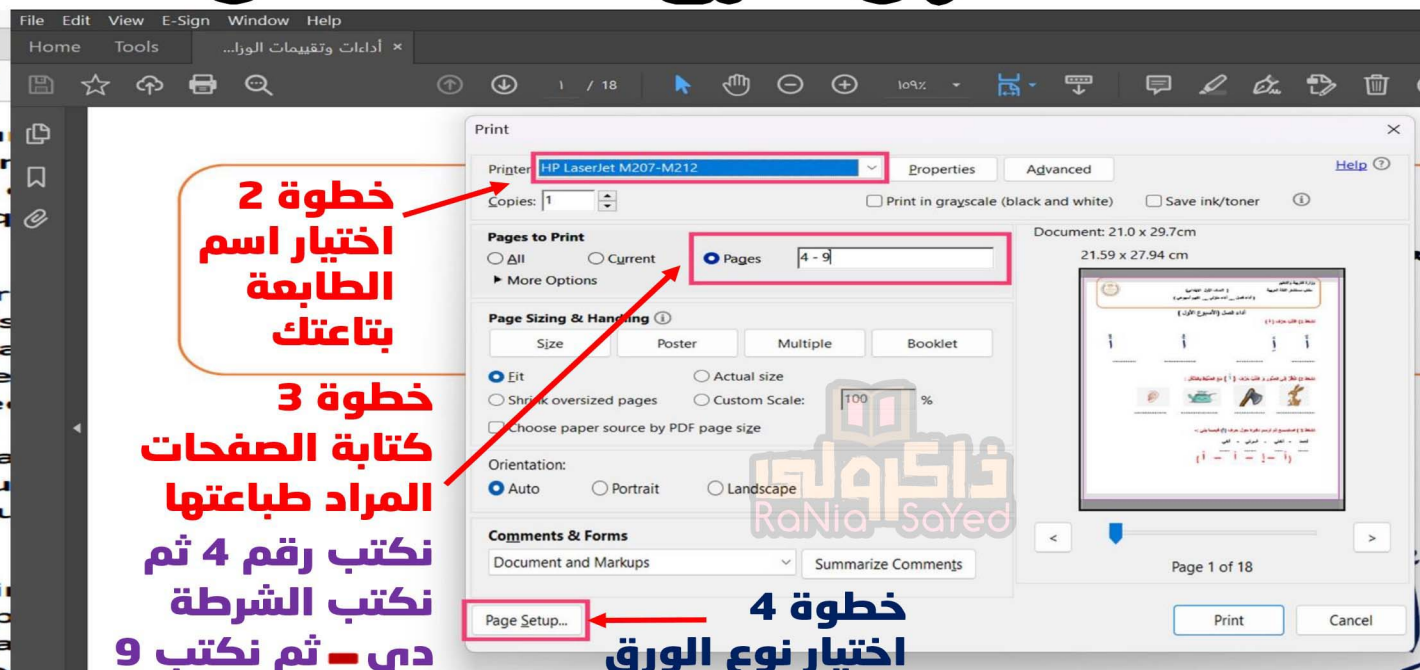
Find the number which if added to each of the numbers 1,13,7,31 they become proportional numbers

$$\begin{aligned} \frac{1+x}{13+x} &= \frac{7+x}{31+x} \\ (1+x)(31+x) &= (7+x)(13+x) \\ 31 + 32x + x^2 &= 91 + 20x + x^2 \\ 32x - 20x &= 91 - 31 \rightarrow 12x = 60 \\ x &= 5 \end{aligned}$$

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



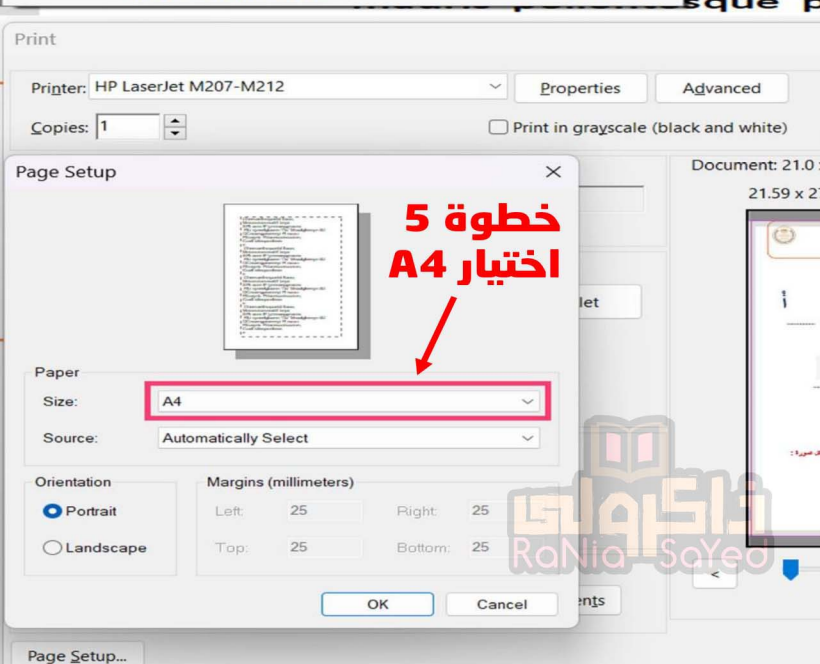
خطوة 1



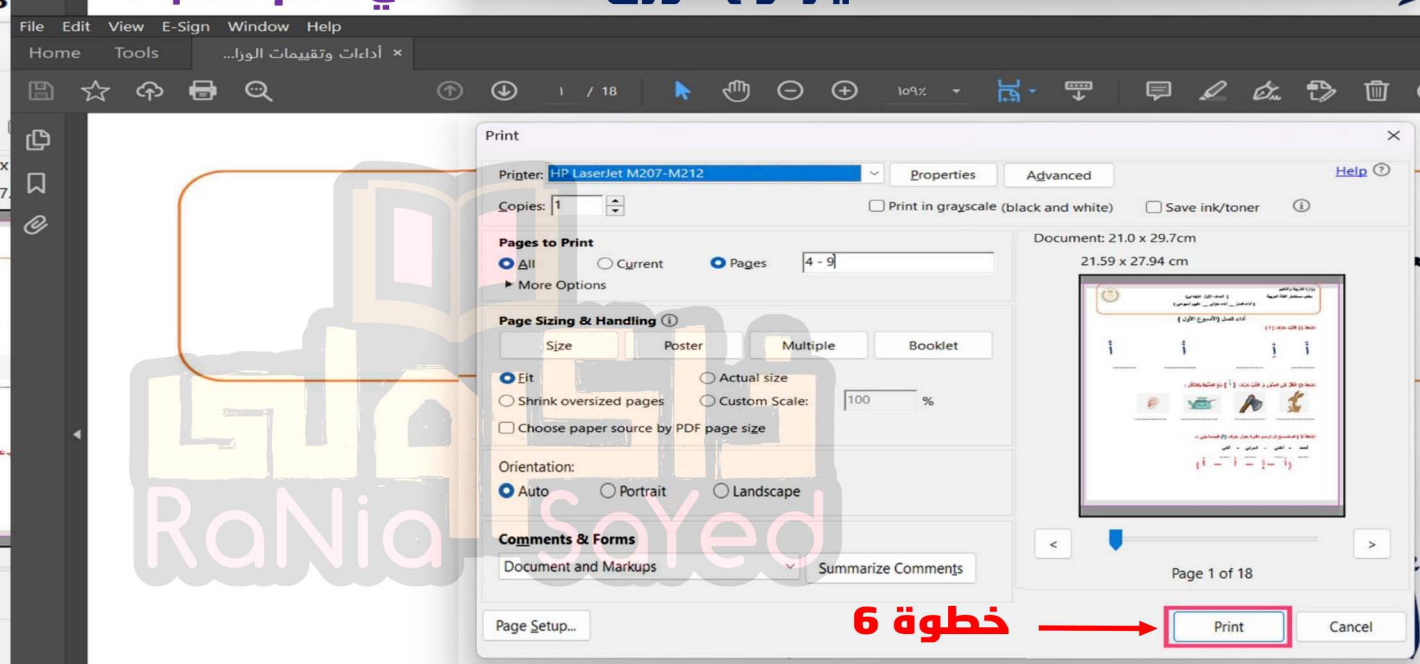
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6